Is Corporate Social Responsibility a Determinant of the Capital Structure of Global Systemically Important Banks?

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Declaration

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Abstract

In the wake of the recent global financial crisis, the banking industry has come under heavy criticism for the negative externalities imposed on the economy and society. The distress of the financial system during the financial crisis has triggered public discussions about the role of bank capital structures in the stability of banking institutions. While it was previously thought that regulatory capital requirements are the sole determinant of bank capital structure, recent empirical studies suggest that, instead, the standard cross-sectional determinants that explain the capital structures of non-financial firms also apply to banks. The findings from these studies prompt further investigation into what other factors determine the capital structure of banks. More recently, engagement in Corporate Social Responsibility (CSR) activities has emerged as a vital dimension through which firms develop sustainable strategies that affect overall firm performance. In addition, the subsequent reporting of CSR performance has become increasingly important as more investors incorporate information about the social behaviour of firms in their investment decisions. This suggests that CSR has implications for the financing policies of firms. In light of the development of CSR as a relevant concept in the current corporate environment and especially in the banking industry, the goal of this study is to investigate whether CSR is a determinant of the capital structure of banks through a multiple regression analysis of panel data from 2009 to 2018 for a sample of 28 Global Systemically Important Banks. Using DataStream Refinitv ESG scores to proxy for CSR, the first hypothesis proposes that socially responsible banks tend to be less leveraged than those that are socially irresponsible due to the positive influence on equity financing from the lower costs of capital, informational asymmetries and risk associated with good CSR performance. The second hypothesis examines the effect of bank size on the proposed relationship. Initial results indicate no significant relation between aggregate CSR and bank leverage, however, further analysis shows a significant negative relationship between the governance dimension of CSR and bank capital structure, suggesting that the governance structures of banks are more relevant for bank capital structure decisions. Bank size is found to have no effect on the relationship. The findings from this study have important implications that are particularly relevant in today's financial environment as calls for the restoration of public trust in banking institutions accelerate.

KEYWORDS: Bank, Capital structure, Corporate social responsibility

Table of Contents

List of Tables

List of Abbreviations

BCBS	Basel Committee on Banking Supervision
CSR	Corporate Social Responsibility
ESG	Environmental, Social and Governance
FE	Fixed Effects
GDP	Gross Domestic Product
GFC	Global Financial Crisis
G-SIBs	Global Systemically Important Banks
OLS	Ordinary Least Squares
RE	Random Effects

Section 1: Introduction

Banks are highly leveraged institutions and while this is an inherent part of the business of banking, excessive leverage can have evident negative consequences that undermine the broader financial and economic systems. In fact, over-leverage in the banking industry was recognised as being the underlying cause of the recent global financial crisis (GFC) (Basel Committee on Bank Supervision [BCBS], 2014:1). Furthermore, high levels of leverage have been known to incentivise banks to take extreme risks that increase their risk profiles and consequently threaten the solvency of these banks (Li, 2017:102; Bhaghat, Bolton & Lu, 2015:521). This problem is especially true for Global Systemically Important Banks (G-SIBs). Since they are deemed to be too systemically important to fail and are protected by too-big-to fail policies, they can always expect to be bailed out by the government. This creates a moral hazard situation where banks are incentivised to engage in higher risk activities in pursuit of greater returns. Such risk-taking behaviour concentrates risks to the banking sector and thus affects the fragility of the entire financial system, making future crises more likely (Bongini, Nieri & Pelagatti, 2015:562).

Central to the discussion on the soundness of banks and a source of stability in the financial system is bank capital. The indefinite maturity of capital is particularly important as it provides a stable source of financing that allows banks to withstand financial and economic shocks (Berger, Herring & Szegö, 1995:408). Furthermore, since banks rely on the public's perception about their health and safety to stabilise core deposit funding, a strong capital base can also boost public confidence in these institutions and reduce the possibility of an infectious bank run (Taggart & Greenbaum 1978:159).

As a result of the link between the leverage levels of banks, bank capital and overall financial stability, the capital structures of banks are a key target for regulation which has led to the commonly held view that capital requirements are binding, thus making regulation the primary determinant of banks' choice of capital levels (Berger et al., 1995:419). Interestingly, however, recent empirical studies suggest that the standard cross-sectional determinants of the capital structures of non-financial firms also extend to banks. The most prevalent contribution in this regard has been drawn from Gropp and Heider (2010:587) whose findings lay the foundation for the study of bank capital structure within a general capital structure framework (Sorokina et al., 2017:37). Based on the work of Frank and Goyal (2009:1), the study helps to identify variables that reliably explain bank capital structures. Taking this into account and in light of

the systemic risk inherent in the banking sector, the importance of banks to global economic and social systems as well as their unique financial features, there are strong grounds to study the capital structure of banks.

Like Sorokina (2017:36), this study extends the literature on the determinants of bank capital structure by adopting a model similar to those used in previous capital structure studies and augmenting it to include the effect of Corporate Social Responsibility (CSR) on bank capital structure. This is because CSR has become an increasingly important part of the overall strategy of most firms as they work to legitimise their existence according to society's standards. Moreover, the last few decades have also seen a growing number of investors account for the social and environmental performance of firms when making investment decisions (El Ghoul et al., 2011:2390; Hong & Kacperczyk, 2009:16). This suggests that the implementation of CSR has consequences for the financing policies of firms. While existing theory and research has established links between the firm's investment in CSR policies and its financing decisions, to the best of the author's knowledge these studies generally do not investigate the influence of CSR on the capital decisions of banks. Therefore, the goal of this study is to fill this gap in the literature.

As discussed above, the capital structures of banks can be greatly relevant to the stability of the banking sector thus understanding the drivers of bank capital decisions is crucial. This is especially relevant for G-SIBs due to the systemic impact their decisions and activities can have on the rest of the financial and economic systems. Accordingly, this paper probes into the following questions;

1. What are the theoretical and empirical links that guide the relationship between CSR and the capital structure of firms?
2. Are CSR and bank capital structure related?
3. If so, what influence does the size of the banks have on this relationship?

By so doing, this study seeks to contribute to the existing, but limited literature on the determinants of bank capital structure. Knowledge gained about CSR in the banking industry and its relation to bank capital structure from this study should provide useful insights for future regulatory policies that aim to reduce the probability of the bank failures and thus limit the negative externalities imposed by large international banks on society. The results of this study should also help to shed light on whether banks are heeding to societal concerns and hence working to restore credibility and public confidence in the financial system.

The remainder of this paper is structured as follows; Section 2 provides a more elaborate discussion on the relevant literature regarding capital structure theories and empirical findings of the variables that are believed to influence the capital structures of firms and thus of banks. Furthermore, the paper discusses the concept of CSR in the banking industry and presents theoretical and empirical arguments that motivate the expectation of a relationship between the CSR performance of banks and their capital structures. Section 3 describes the research approach adopted for this study, including the methodology and data. Section 4 reports and analyses the results and findings of the regression tests. Finally, Section 5 concludes with discussions on the limitations of the study and the areas identified for future research.

Section 2: Literature Review

This section provides an analysis of the relevant background on the capital structure decisions of firms and the social responsibilities of the banking industry. It begins with a discussion on the theoretical principles underlying capital structure and discusses the empirical findings of firm-level characteristics that determine the capital decisions of non-financial firms as a context for bank capital structure. It then proceeds with an overview of CSR, including its application and relevance to the banking industry. Finally, the section concludes with a review of the theoretical predictions and previous empirical researches on the impact of CSR participation on firms' capital structures. From this review, the hypotheses of the study are developed.

2.1 Capital Structure

The capital structure of a firm refers to the way in which it finances its operations and assets, which usually involves a choice between various forms of debt and equity. Depending on the advantages and disadvantages of each form of financing, companies may choose to issue strictly debt or equity or a combination of both. Over the years, the subject has received a great deal of attention which has resulted in the development of formal theories and empirical studies that test the capital decisions of firms. Notably, banks have often been excluded from capital structure literature due to the belief that bank capital structure is primarily driven by regulation (Sorokina, Thornton Jr. & Patel, 2017:36). As a result, there exists very little literature on the determinants of banks' capital structures.

While past theoretical research on the capital structure of banks has generally been limited to the existence of an optimal capital ratio (De Jonghe & Öztekin, 2015:154), a few empirical studies that examine whether capital requirements are the sole determinant of banks' capital structures have recently emerged. In a leading study by Gropp and Heider (2010:587), the authors hypothesise that mispriced deposit insurance and capital regulation are secondary determinants of bank capital structure and that, instead, the standard cross-sectional determinants of non-financial firms also explain banks' capital structure, except for banks that hold levels of capital that are close to the regulatory minimum. Using a sample of 200 large, publicly listed American and European banks over the period 1991 to 2004, they find that the sign and significance of the effect of the standard determinants observed under empirical studies on the capital structure of non-financial firms also apply to banks. Furthermore, they refute the notion that the high levels of discretionary capital observed in the banking industry can be explained by the buffers held by banks to guard against falling below the minimum capital requirements. In a similar study, Teixeira et al. (2014:34) extend Gropp and Heider (2010:587)'s study by examining banks' excess equity capital based on the observation that, on average, banks hold capital in excess of the regulatory minimum. They extend the period used by Gropp and Heider (2010:587) from 2004 to 2010 and based on a larger sample of 560 American and European banks, they also find that factors that determine the capital structure of non-financial firms play a similar role in explaining banks' capital structures. Further investigation on the determinants of banks' equity capital reveals that the buffer view of banks' capital structure is also not validated. Overall, these studies relegate capital regulation and the buffer view of capital to secondary importance and suggest that standard capital structure literature explains the capital structures of banks.

2.1.1 Capital Structure Theories

Much of the literature on modern capital structure theories begins with the seminal contributions made by Modigliani and Miller. Their first proposition, often referred to as the capital structure irrelevance theorem, states that the capital decisions of a firm have no bearing on its value, therefore, managers cannot alter the value of a company by changing its level of leverage (Modigliani & Miller, 1958:268). In formulating this proposition, they assume that there are no arbitrage opportunities and so they theorise the absence of taxes, information asymmetries as well as agency and bankruptcy costs. This implies that the value of a levered

firm is equivalent to the value of an unlevered firm. Accordingly, investors would be indifferent about buying into two identical firms that differ only by their choice of capital structure.

In their second paper, Modigliani and Miller (1963:433) relax their assumptions to introduce corporate taxes and acknowledge that taxes provide an additional source of value owing to the tax deductibility of the interest expense associated with debt financing. The tax treatment of the interest charges reduces the firm's income tax liabilities and results in more free cashflows due to the increase in profits after tax (Kraus & Litzenberger, 1973:911), thus the value of the firm should increase in proportion to the amount of debt used. This suggests that, in order to maximise the firm's value, firms ought to take advantage of this tax benefit by accumulating as much debt as possible. However, in practice, as firms approach a pure debt capital structure, the interest expense paid on debt financing increases to compensate the suppliers of debt for the additional risk of leverage above what they deem as acceptable (Simon, 1963:276). In addition, Baxter (1967:397) explains that an increase in debt above a certain level induces the risks of financial distress because of the volatility of the expected earnings and as a result, the firm's average cost of capital will increase. Therefore, the author argues that no rational firm will choose to finance its assets using exclusively debt when it can do so by using its existing mix of debt and equity at a cheaper cost of capital.

Modigliani and Miller's propositions have influenced the emergence of a vast amount of theoretical and empirical research on corporate financing decisions. Succeeding literature on capital structure presents two main influential theories that emanate from the departures of these classical papers; the trade-off theory and pecking order theory (Myers, 2001:82).

The trade-off theory is considered to be an extension of Modigliani and Miller (1963)'s propositions since it suggests that there is a mix of debt and equity finance that maximises the tax advantages of debt while minimising the costs of financial distress that arise from possible bankruptcy. The theory proposes that the capital structure of a firm is thus driven by the need to balance the marginal benefits and marginal costs of borrowing in order to maximise the value of the firm (Jensen 1986:324). This "trade-off" implies that there is a threshold level of debt and hence an optimal capital structure that maximises the firm's market value (Stulz, 1990:4). Several studies have shown the existence of an optimal capital structure in accordance with this theory and confirm that firms make the choice between different levels of debt and equity to adjust their capital structure toward their target leverage ratios. For instance, Hovakimian, Hovakimian and Tehranian (2004:519) observe that firms are deliberate in issuing

both debt and equity, suggesting a target capital structure, and that deviations are offset to keep the financing structure close to the target. Using a partial adjustment model of firm leverage, Flannery and Rangan (2006:471) also find that non-financial firms target a long run target capital structure and estimate that deviations from the desired levels of leverage tend to be reversed quickly.

As discussed, the benefit of debt finance provides an incentive for companies to borrow as much as possible in order to maximise the value of the debt tax shield. However, the increase in borrowing raises the cost of debt finance due to the higher risk of defaulting on interest payments and the accompanying costs of financial distress. This is because by its very nature, debt represents a legal financial obligation to make fixed payments to providers of debt as they become due, failing which, the firm may be declared insolvent and incur the associated bankruptcy costs (Kraus & Litzenberger, 1973:911-912). According to Myers (1984:580), the costs of financial distress are a combination of the direct legal and administrative costs incurred in the event of a bankruptcy as well as the indirect costs that firms face due to the collapse of contractual relationships. These indirect costs may arise from the hesitancy of stakeholders to continue dealing with a firm that is experiencing operational disruptions because of financial constraints and is, therefore, unable to meet its contractual commitments (Baxter 1967:399). In addition, Jensen and Meckling (1976:334) identify the shareholder-debtholder conflict as the source of agency costs of debt. This conflict occurs because the availability of debt funds encourages shareholders to make suboptimal investment decisions at the expense of debtholders. Due to their limited liability, shareholders stand to benefit higher returns from risky investments but if they fail, the losses are borne by the debtholders (Harris & Raviv,1991:301).

The pecking order theory is an alternative capital structure theory that is often regarded as an opponent of the trade-off theory (Frank & Goyal, 2003:19; Myers, 1984:581) and was developed from the works of Myers (1984:575) and Myers and Majluf (1984:187). It does not assume that firms have leverage targets, instead, it posits that in making decisions about how to finance investment opportunities, firms usually prefer internal capital to external capital. This preference results from the information costs and adverse selection issues that arise due to the information asymmetry that exists between managers and investors (Hovakimian et al., 2004:518). As insiders of the firm, managers are generally believed to know more about the firm's future profits and risks, hence its true value, than outsiders and therefore, their financing

decisions are thought to signal information about the prospects of the firm to investors (Myers, 1977:148; Myers, 1984:575).

The theory assumes that capital structure decisions are arranged such that the costs of adverse selection are minimised. Typically, adverse selection issues can be resolved using retained earnings, however, external sources of finance have adverse selection risk premiums that make them riskier and so raise financing costs (Frank and Goyal, 2003:220). Therefore, firms will opt to finance new projects using internally generated cashflows until they are exhausted and will only source funds externally when more capital is required. Since safer securities are issued before riskier ones, debt financing is generally preferred over equity. This is because the lower information costs associated with debt make borrowing relatively cheaper, thus in order to avoid the costs from the adverse signalling of equity issuances, new equity is only ever raised as a last resort (Myers & Majluf, 1984:203).

Several empirical studies have tested the superiority of these two opposing theories. For instance, Shyam-Sunder and Myers (1999:219) test the pecking order theory against the trade-off theory on a panel of 157 non-financial firms and find that amongst these firms the pecking order theory offers a better empirical explanation for the debt/equity choices of mature, public firms than the trade-off theory does. In contrast, the results from Frank and Goyal (2003:218) are inconsistent with the assumptions of the pecking order theory. Using a sample of 157 publicly listed American firms, they find that equity as opposed to debt finance, accounts for a significant portion of firms' external finance. In addition, their results show that the theory better explains the financing choices of larger rather than smaller firms. To date, research is yet to reach a consensus on which of the theories provides better explanatory power for corporate financing decisions and recently, the market signalling theory and market timing theory have also emerged as possible explanatory capital structure theories.

2.1.2 Determinants of Capital Structure

Over the years, capital structure literature has agreed on a common set of variables that have been observed to influence leverage levels. These are formally referred to as the determinants of capital structure. Among these variables, Rajan and Zingales 1995(1451) identifies the four core firm-specific factors (firm size, asset tangibility/collateral, profitability and growth/market-to-book ratio) that have repeatedly shown up as explanatory variables in empirical capital structure studies. According to Frank and Goyal (2003:223), these four factors

have survived various tests and therefore, play a significant role in explaining the capital structure decisions of firms.

In assessing the impact of these factors on leverage, prior studies adopt alternative measures of leverage based on short-term, long-term and total debt. Short-term debt refers to the portion of firms' total debt obligations (including deposits and current accounts in the case of banks) repayable within one year whereas long-term debt is the total debt repayable beyond one year. Total debt is the sum of short and long-term debt. Although Rajan and Zingales (1995:1429) argue that the most appropriate measure of leverage is based on total debt as it includes items which may be used for financing purposes rather than for transactions, Gropp and Heider (2010:603) note that much of the empirical research for non-financial firms use long-term debt in the leverage measure. Nonetheless, Frank and Goyal (2009:12) affirm that crucial results are largely robust to alternative definitions of leverage. Notably, the pecking order theory also makes predictions about the maturity and priority structure of debt and suggests that since securities with the lowest information costs will be issued first, short-term debt will be issued before long-term debt in event that external financing is needed (Frank & Goyal, 2003:219). Leverage can also be measured in book value or market value terms, however, Titman and Wessel (1988:7) state that there is very little difference between the two measures as they are closely correlated.

The factors listed above and their effect on some form of leverage measure are discussed as follows;

- **Firm size**

The relationship between the size of a firm and leverage is typically viewed on the basis of its ability to diversify its business operations and in raising finance. However, there are conflicting theoretical expectations regarding the effect of firm size on leverage. In line with the trade-off theory, Titman and Wessels (1988:6) argue that larger firms face lower risks of bankruptcy or financial distress as they are usually more diversified, and this allows them to take on more debt without the concern of defaulting on future debt payments. Under the pecking order theory, financing costs increase with higher information asymmetries; the higher the asymmetries, the greater the risk to outside investors and this is reflected in the price of issued securities. Rajan and Zingales (1995:1457) note that larger firms have lower informational asymmetries and are therefore expected to be less leveraged since they incur lower costs in issuing new equity. In addition, large firms tend to have credible reputations within debt

markets and are thus able to borrow easily and inexpensively because of lower information costs (Frank & Goyal,2003:224). Conversely, Marsh (1982:123) argues that due to issuance costs and pronounced difficulties in accessing capital markets, small companies often depend on bank loans for funding. This is supported by Titman and Wessels (1988:6) who state that the cost of issuing securities is related to the size of a firm and suggest that small firms may prefer debt to equity because of the higher expected costs of issuing new equity and somewhat of issuing long-term debt. This suggests that small firms will not only be more leveraged but that they will prefer short-term debt over long-term debt due to the lower transaction costs associated with the former.

- **Asset Tangibility**

According to Titman and Wessels (1988:3) the asset structure of companies influences their capital structure decisions. Tangible assets such as property and machinery are generally visible to outside investors and hence easier to value than non-physical assets (Frank & Goyal, 2009:9). This ease of valuation lowers distress costs and suggests that the greater the fraction of a company's tangible assets, the higher the company's liquidation value. Furthermore, tangible assets often serve as collateral in financing arrangements which reduces the agency costs of total debt and thus encourages borrowing (Rajan & Zingales, 1995:1451). Campello and Giambona (2013:1) extend the argument on collateral by considering the capacity of creditors to repossess assets when their debtors become delinquent. They find that assets that can be repossessed and easily disposed of offer more security to debt providers and so they are more willing to supply funds. Moreover, they report that generic assets such as land and buildings better support the capacity for borrowing since these assets can be redeployed. Altogether, these arguments suggest that leverage is positively correlated with the tangibility of corporate assets.

- **Profitability**

Although the financial performance of firms has been observed to drive their financing decisions, the effect of profitability on leverage also remains ambiguous. Profitability is a measure of asset productivity (Barton, Hill & Sundaram, 1989:40) and is synonymous with the firm's ability to generate and retain income. Consequently, the pecking order theory predicts that profitable firms will be less leveraged since they are more likely to rely on internal cashflows to finance their assets. Debt is only issued when internal reserves have been depleted. This is consistent with the findings of Shyam-Sunder and Myers (1999:221) who state that the

firm's debt levels are driven by the need for external finance and tend to grow with available investment opportunities. The more the opportunities, the greater the level of debt to cover the shortfall in cashflows initially met by retained earnings. Fama and French (2002:4) also find that leverage levels are generally low for more profitable firms with few investment opportunities. Likewise, findings from Titman and Wessels (1988:2), Rajan and Zingales (1995:1451) and Myers (2001:89) suggest a negative profitability-leverage relationship. On the other hand, the trade-off theory predicts that a positive relationship should exist between leverage and profitability since it posits that savings from the debt tax shield can lower income tax liabilities. This tax benefit is more valuable to profitable firms who are subject to higher taxes liabilities, thus in order to reduce their tax expenses, firms may take on more leverage (Frank & Goyal 2003:224; Frank & Goyal, 2009:7). Furthermore, the large amounts of free cashflows generated by highly profitable firms increase the agency costs of the conflict between managers and shareholders. In order to reduce these costs and the cashflows available for management spending, firms will issue more debt (Jensen,1986:324).

- **Growth**

A firm's capacity to finance future opportunities is affected by its growth rate (Barton et al. 1989:41). Growing firms have large financing needs due to the positive net present value (NPV) opportunities available to them. This places a greater demand than can be met on internal cashflows, and as a result firms often resort to external capital to fund the growth. Since the pecking order theory assumes that firms prefer to issue the safest security first when the need for external funding arises, it predicts that high growth firms will be more leveraged because of the reluctance to issue equity and implies that expected growth will be negatively related to long-term debt levels as growing firms will prefer short-term debt as the safer security. However, the trade-off theory counters this view point and instead argues that firms with high market-to-book ratios, which is often used as the proxy for growth opportunities (Frank & Goyal, 2009:8), are unlikely to take on debt as the chances of financial distress and the associated costs increase with expected growth. Myers (1977:149) supports this stance through an elaborate discussion on the high agency costs that arise from the sub-optimal behaviours of high growth firms. Furthermore, Hovakimian, Opler and Titman (2001:2) argue that firms consist of both tangible and non-tangible assets in the form of growth opportunities. These opportunities are mostly funded by issuing equity to take advantage of the perceived value of their growth prospects whereas physical assets are funded using mostly debt. Frank and Goyal (2003:224) also emphasise the limitations placed on these firms' ability to accept

positive NPV projects, causing them to pass up profitable investments. In general, empirical studies conclude that the relation between expected future growth and leverage is negative.

Table 1 provides a summary of the theoretical predictions together with the findings from empirical research on capital structure decisions.

Table 1: Theoretical Predictions and Empirical Findings of Capital Structure Determinants

FACTORS / DETERMINANTS	THEORETICAL PREDICTIONS		EMPIRICAL FINDINGS
	Pecking order theory	Trade-off theory	
Firm size	-	+	+/-
Asset tangibility	+	-	+
Profitability	-	+	+/-
Growth	+	-	-

Source: Author's own based on capital structure theories and empirical research studies

The signs and significance of the effects of these determinants have also been found to apply to bank leverage (Gropp & Heider, 2010:589). Although not as reliable as the factors discussed above, several other factors have emerged in previous well-known capital structure studies as explanatory variables of firms' capital structure. These include dividend payment, asset risk and taxes. Dividends are inversely related to debt as dividend paying firms have free cashflows and so are assumed to face fewer financial constraints. Asset risk is also inversely related to leverage because volatile returns give rise to financial distress so firms with volatile stocks tend to carry less debt (Frank & Goyal, 2009:9). Tax is positively related to leverage since higher tax rates encourage borrowing. Noticeably, CSR does not appear as one of the determinants. An overview of CSR and its recently established link to capital structure are discussed in the next subsection.

2.2 Corporate Social Responsibility

The concept of CSR is hardly new, however, it has gained significant traction over the past few decades. The substantial increase in CSR investments, disclosure of CSR initiatives through published reports and research studies on the concept have cemented the importance of CSR in business literature (Malik, 2015:419). However, despite its growing relevance to the current business environment, there is no universal definition of CSR. The World Bank (2003:1) defines CSR as "the commitment of business to contribute to sustainable economic development, working with employees, their families, the local community and society at large

to improve quality of life, in ways that are both good for business and good for development". In the same manner, the Commission of European Communities (2001:6) defines CSR as ''a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis.'' Although the definitions of CSR vary, they all emphasise the firm's responsibility for society and for creating value for all stakeholders (Perez & del Bosque, 2012:154). Overall, CSR is viewed as the additional efforts made by firms to promote sustainability via sound business operations (Cui, Jo & Na 2013 :549).

According to Jizi et al. (2014:603), CSR can offer financial and strategic benefits by helping firms establish good reputations and relations with their stakeholders. Over the years, an increasing amount of CSR research has been dedicated to quantifying the consequences of the social and environmental performance of companies (Harjoto & Jo, 2015:2). The most common research question in this regard is related to the link between CSR and financial performance. To date, research conducted in this direction has produced inconclusive results among researchers (Girerd-Potin, Jimenez-Garcès & Louvet, 2014:560). In addition, a wide range of similar studies have focused on the other aspects of the firm, including corporate identity, corporate governance, earnings quality, firm value, firm risk, access to capital markets, cost of capital, information asymmetries etc. In spite of its benefits, CSR is subject to criticism. One of the earliest critics of CSR was the well-known economist, Milton Friedman, who famously believed that shareholder wealth maximization should be the sole objective of a firm (Hurley & Waqar, 2014:360). Since then, other opponents have also argued that the diversion of firm resources to meet social responsibilities ultimately distorts the purpose of the corporation. Other critiques tend towards firms' reasons for investing in CSR. Sprinkle and Maines (2010:446) identify several of these reasons which include altruism, strategic motives and window-dressing, with firms being especially criticised for the latter.

Nevertheless, there is no doubt that firms have responsibilities towards society (Malik 2015:426). Despite the on-going debates about the legitimacy and financial implications of CSR, the increasing amount of theoretical developments and empirical investigations on the subject emphasise its significance in today's modern business environment where firms are required to be socially responsible. Therefore, the concept of CSR will continue to be an essential part of academia and business management as it underlies many of the ethical and stakeholder-oriented theories and is consistent with societal expectations of the business community (Caroll, 1999:292).

2.2.1 CSR in the Banking Industry

Unlike non-financial firms, the systemic effects posed by the actions of banks are what differentiates them from other firms and limiting this systemic effect is important for society (Stulz, 2016:47). It has already been established that the safety and financial soundness of the banking industry and the wider financial system generates benefits for society. To fulfil their financial intermediation role, banks rely substantially on the funds provided by society. For this reason, they are subject to intense public scrutiny and are required to provide feedback on their activities to the public more often than other industries (Wu & Shen 2013:3530). In response to the increasing pressure to acknowledge their social responsibility, banks are progressively engaging in voluntary disclosures of non-financial information via published sustainability reports to provide feedback on how they are faring as corporate citizens. In fact, the banking sector is recognised as being amongst the leading CSR investors, globally (Scholtens, 2006:19; Perez & del Bosque, 2012:160).

The engagement of large international banks in controversial and socially irresponsible practices during the GFC caused the erosion of public trust in these institutions due to the negative effects imposed on the economy and society (Esteban-Sanchez, Cuesta-Gonzalez & Paredes-Gazquez 2017:1102). Therefore, it would appear that there is scope for extensive application of CSR in the banking industry. Wu and Sheng (2013:3531) note that one the most important ways to integrate CSR into the banking industry is through the role of bank reputation. According to Perez and de Bosque (2012:146), reputation building is highly relevant for firms that are perceived to be highly risky and are therefore, subject to intense monitoring. It thus becomes essential for these firms to provide supplementary non-financial information such as that on CSR, which is an important tool for influencing public image and is increasingly being sought after by stakeholders. This is especially relevant in the context of the heavily regulated and highly visible banking industry that is vulnerable to the public's perception about its activities. Through improved reputations, banks adopting CSR can regain their credibility and thus attract more customers than non-CSR banks (Wu & Shen 2013: 3532).

Likewise, socially responsible banking is also becoming a well-established concept in the financial services sector (Scholtens 2009:159). Through their roles as providers of financing, banks can be indirectly involved in the negative environmental and social activities undertaken by the firms they fund. Therefore, they may be keen to integrate CSR into their traditional screening and monitoring processes (Nizam et al., 2018:40). Since CSR is often perceived as a

risk to the financier, banks can incorporate this risk into their risk assessment procedures which ensures that finance is more easily available to businesses that contribute positively to social and environmental welfare, thus encouraging these firms to evaluate their own CSR strategies in order to qualify for funding. Scholtens (2009:161) argues that one of the weaknesses of applying CSR principles to the banking industry via this role is that it is of an "indirect, intermediate" nature and is thus only effective to a certain extent. Goss and Roberts (2011:1795) also contend that the small economic impact of concerns about the CSR ranking of borrowers on the interest spreads of bank loans suggests that banks view CSR risks as a second-order determinant of interest rates and that borrower quality depends more on the availability of collateral. At the same time, however, the authors note that there is evidence that banks view CSR concerns as risks and respond with less attractive lending terms (Benlemlih, 2017:6).

More recently, a few empirical works have investigated the link between CSR and the financial performance of banks but due to the limited number of studies so far, the results of studies conducted in this direction are inconclusive. Overall, these studies highlight the growing relevance of CSR and its financial implications in the banking industry.

2.3 CSR and Capital Structure

Much of the discussion so far has focused on capital structure and CSR in isolation. In this sub-section, the theoretical links and empirical findings that support the existence of a relationship between CSR and capital structure are reviewed.

2.3.1 Theories on CSR and Capital Structure

According to Aras, Tezcan and Furtuna (2018:601), there are three main theories that relate to the CSR framework; the Legitimacy, Stakeholder and Agency theories. The Legitimacy theory is related to the idea of a "social contract" where a firm's survival depends on its ability and willingness to adhere to society's perception of what is deemed as desirable behaviour in order to access the resources it requires to continue operating (Deegan, 2002:293). The theory suggests that firms do not have an inherent right to exist but require the granting of a "license to operate" by society (Hahn & Kühnen, 2013:14). Legitimacy thus becomes a resource that firms need to operate and if they are perceived not to be conducting their business in an acceptable manner, this resource and its accompanying license may be revoked (Deegan, 2002:293). For instance, this may be evidenced by customer or supplier boycotts. Accordingly, firms that comply with societal expectations and consider themselves as good corporate

citizens will be eager to give feedback on their CSR activities as part of their legitimising strategy to justify their right to exist as well as to distinguish themselves from firms that do not meet society's standards. This applies even more so in the case of banks as they depend on public perception regarding their soundness and the resources provided by the public to perform their most critical functions. Failure to uphold public confidence in the safety of the banking industry may give rise to crippling bank runs as witnessed during the GFC. Since depositors want banks to hold as much capital as possible, the legitimacy theory suggests that banks will account for their social responsibility by holding more capital in order to continue receiving the resources they require to operate.

The Stakeholder theory is based on the existence of a diverse group of stakeholders that have an interest in the firm and are affected or can affect its operations. Hahn and Kühnen (2013:5) argue that the pursuit of different social, economic and environmental interests by these different groups of stakeholders can determine the success of a firm. Moreover, since firms rely on other stakeholders other than long-term shareholders for the supply of resources, the engagement of firms in CSR is not only of interest to its shareholders but to these other stakeholders as well. There is, therefore, an expectation for firms to balance the collective expectations of their stakeholders (Jizi et al., 2014:603). According to Barton et al. (1989:36), the Stakeholder theory can explain the behaviour of firms and thus be used to develop cross-sectional predictions about the capital structure of firms. The authors view the firm as a collection of claims held by different stakeholders; the resources supplied by stakeholders are viewed as assets as they allow the firm to continue its business while explicit and implicit stakeholder claims are viewed as liabilities. The difference between the assets and liabilities defined in this way is referred to as the net organisational capital (NOC) and high levels of positive NOC, that is, when assets exceed liabilities, should lead firms to have relatively low levels of debt (Barton et al., 1989:43).

Harjoto (2017:488) extends the stakeholder argument with reference to Jensen (2001:236)'s enlightened value maximising theory which posits that while meeting the needs of non-investing stakeholders is important, the ultimate goal of managers is to increase the long-term future value for both investing and non-investing stakeholders, that is, there is a trade-off between the resources used to fund CSR activities and the provision of long-term value for all stakeholders through CSR. Based on this theory, the authors argue that there are costs associated with engaging in CSR activities to satisfy non-investing stakeholders. Therefore, if CSR expenditure is expected to increase operating costs more than the expected gain in total

contribution margin then CSR will increase the firm's pre-tax cost of doing business which will in turn reduce the firm's pre-tax income. In this way, CSR expenditure is viewed as a substitute for the debt tax shield, especially when debt levels are low. It can be thus concluded that firms that invest in CSR tend to reduce debt financing, resulting in a negative relation between CSR and financial leverage.

The Agency theory is primarily concerned with the conflicts that arise between managers, shareholders and debtholders and the related agency costs. Bae, Kang and Wang (2011:131) use Jensen (1986:323)'s analysis on the agency costs of free cashflows to link the firm's CSR initiatives and its capital structure. The authors argue that since the availability of large free cashflows incentivise managers to invest beyond optimal levels in pursuit of their own benefit, high levels of leverage can curb such behaviour. They assume that firms with larger free cashflows are likely to have more resources to invest in CSR initiatives than those with fewer free cashflows, consequently these firms are likely to invest in CSR even if these initiatives do not maximise shareholders' wealth. If debt is to serve as a disciplinary tool in preventing management from diverting free cashflows to inefficient investments, then high leverage is expected to control for overinvestment in CSR. This suggests that the relationship between leverage and CSR would be negative. Furthermore, Aras et al. (2018:601) argue that CSR reporting can reduce informational asymmetries between a firm and its stakeholders and alleviate agency problems. Wu and Shen, (2013:3532) draw the same conclusions regarding the voluntary CSR disclosures by banks. They state that banks with proper CSR programs are able to reduce information asymmetries with stakeholders and obtain the support of society through CSR reporting. Therefore, investors are more willing to invest in banks that achieve good CSR performance and report on their CSR activities.

To summarise, while all the theories discussed above explain how the engagement in and reporting of CSR activities can affect financing decisions, the Agency theory further explains why CSR firms are likely to attract more investors than non-CSR firms. Wu and Shen (2013:3529) further discuss the driving motives of bank's engagement in CSR and based on the three motives of strategic choice, altruism and greenwashing, they find that the strategic motive is the primary driver of the CSR activities of banks. By adopting CSR in this manner, banks can still create a mutually beneficial situation for both shareholder and stakeholder groups. Overall, these three theories provide a basis for the theoretical prediction of a relationship between CSR and capital structure. Specifically, they suggest that firms and thus banks would be expected to account for societal concerns in their capital decisions. The rest

of the discussion continues with the empirical findings that further support the predicted relationship.

2.3.2 Empirical studies on CSR and capital structure

In evaluating the financial value of CSR, most studies focus on accounting and market-based performance measures. Consequently, only a few CSR studies are related to the capital markets (El Ghoul et al., 2011:2389). The previous discussion on the pecking order theory illustrated that information asymmetry and cost of capital are closely related to the capital structure of firms. Several empirical works discuss these concepts in the context of CSR. Benlemlih (2017:2) provides a systematic review of some of these studies in relation to the financing decisions of firms and asserts that the related literature suggests a relationship between CSR and capital structure.

As previously stated, Modigliani and Miller's propositions assume that under perfect capital markets there is information symmetry, however, in reality managers have more information about the firm's activities than outsiders. There is unison agreement in the corporate world about the value of information other than that presented in the financial statements. Cho, Lee and Pfeiffer Jr. (2013:72) contend that investors are particularly interested in information regarding the CSR engagements of firms. Furthermore, investors now incorporate the commitment of firms to environmental and social responsibility into their investment decisions (El Ghoul et al., 2011:2390; Jizi et al, 2014:603). The disclosure of additional non-financial information is thus important to investors as well as to other stakeholders as it provides a more complete view of the company.

Several empirical studies suggest that CSR reporting affects the level of information asymmetry between the firm and its stakeholders. Using the issuance of stand-alone CSR reports and the accuracy of analysts' forecast as proxies for CSR performance and information asymmetry, respectively, Dhaliwal et. al (2012:59) observe that the disclosure of CSR information is significantly associated with a reduction in forecast errors and thus gives a good signal to different stakeholders about the value of additional non-financial information disclosed by the firms. Furthermore, the association is amplified for countries that are more stakeholder-oriented and whose financial performance is likely to be more affected by CSR performance (Dhaliwal et. al, 2012:752). In a similar study, Cho et al. (2013:71) instead use CSR scores from the Kinder, Lydenberg, and Domini database (KLD STAT) and bid-offer spreads as the relevant proxies. They argue that both positive and negative CSR performance

(as measured by the scores) provide information that seemingly reduces information asymmetry, with the negative CSR performance having a much stronger influence in reducing the bid-offer spreads. In addition, they posit that this effect differs for investors who do not possess the same levels of information based on the fact that more-informed institutional investors, who usually have access to private information, utilise it in a manner that lowers the reduction in asymmetry. Overall, their results suggest that CSR performance is beneficial to investors and that regulatory intervention may be required to resolve the adverse selection issues faced by less-informed investors.

According to Lopatta, Buchholz and Kaspereit (2016:482), firms that engage in CSR activities enjoy the benefit of low informational asymmetries. This is because a firm's commitment to socially responsible behaviour contributes to its trustworthiness which means it is less likely to conceal information. The authors rely on the abnormal returns from insider transactions for firms listed on the MSCI World index as a proxy for information asymmetry to show that firms with a high CSR scores achieve lower abnormal returns, suggesting an inverse relation between CSR performance and information asymmetry (Lopatta et al.,2016:458). In a more recent study based on the public equity market in America, Cui, Jo and Na (2018:549) argue that the negative relation is more significant for high-risk firms, indicating the extra efforts made by managers to reduce information asymmetries and avoid selection issues through the voluntary disclosure of CSR information. Moreover, they find that their results are consistent with the stakeholder theory which views CSR engagements and disclosures as channels through which firms can better communicate with stakeholders and thus build and maintain their reputations. Consequently, they conclude that CSR engagements are negatively associated with reputational risk which in turn lowers information asymmetry.

Based on the findings of these studies, there appears to be convincing evidence that the disclosure of CSR activities contributes to a reduction in information asymmetry and thus plays a positive role in the decisions of investors. In the same accord, CSR appears to have implications for the cost of capital. According to La Rosa et al. (2018:519), the cost of capital can indicate CSR risks and benefits. Furthermore, as a key input to analyst forecasts and investment decisions, the cost of capital is a tool that capital markets can use to incentivise social responsibility amongst firms (Henkiel, Kraus & Zechner (2001:431). This would imply that socially irresponsible firms face higher costs of capital. Empirical discussions on the relationship between CSR and the cost of financing are divided between the two sources of external capital, that is, equity and debt.

El Ghoul et al. (2011:2389) study the effect of social responsibility on the ex-ante cost of equity for firms in America and hypothesise that the cost of equity is lower for firms with high CSR scores because firms with low CSR scores have a higher perceived risk and thus a smaller investor base. They find this to be the case and observe that employee relations, environmental policies, and product strategies are the greatest contributors to the reduction in the equity financing costs. Their results also suggest that firms in ‘‘sin industries” such as tobacco and nuclear power have very high equity costs. Likewise, Dhaliwal, Li and Yang (2011:59) show that firms with high costs of capital are not only able to realise a reduction in their cost of equity capital by initiating voluntary disclosure of social performance, but they also attract increased institutional ownership and analyst coverage. Sharfman and Fernando (2008:570) also provide evidence that financial markets reward better management of environmental risks through a lower cost of equity since it contributes to the soundness of overall risk management. This makes intuitive sense since the cost of capital typically reflects the level of risk associated with a company. However, their results also suggest that the cost of debt increases with better environmental risk management actions as it enables firms to take on more debt.

Studies on the effect of CSR performance on the cost of debt distinguish between private debt and corporate debt financing. Goss and Roberts (2011:1794) examine the link between CSR and the cost of bank debt in America. As previously discussed, they argue that financiers appear to be indifferent to the CSR tactics of secured borrowers, however, in the absence of collateral, the same financiers are more sensitive to concerns regarding the social performance of businesses. As a result, socially irresponsible firms are more likely to pay higher loan spreads (between 7 and 18 basis points) and shorter debt maturities than their socially responsible counterparts. Overall, they claim that banks are mostly concerned about the quality of borrowers in terms of the security they provide, and CSR concerns are understood to be of secondary importance. Ye and Zhang (2011:197) use the ratio of charitable giving to sales as a measure of CSR to explore whether improvements in firms’ CSR performance lower the cost of debt financing in China. They contend that there is an optimal level of CSR investment such that investments below this level reduce the cost of debt financing whereas investments above it increase the cost of financing. Interestingly, they argue that extremely low or high levels of investments increase the cost of debt financing. Overall, the results concerning the relationship between CSR and debt financing are ambiguous.

Given that the levels of CSR and related disclosures by firms have been found to contribute to reductions in information asymmetry and costs of capital, there is a reasonable amount of

theoretical and empirical groundwork to expect CSR to influence the capital structure decisions of firms and in accordance with this study, of banks. The direction of this relationship is suggested by Bae, Kang and Wang (2011:130) who investigate the relationship between investments in human resources and firm leverage using the stakeholder theory of capital structure. They find that firms who treat their employees fairly as evidenced by high employee friendly ratings have low levels of leverage, suggesting a negative relation between the two variables. In addition, the negative relation carries over when a different measure, namely inclusion in the "100 Best Companies to Work For'' list published by Fortune magazine, is used and thus conclude that employment treatment is an important determinant of capital structure. However, the study only focuses on a single aspect (workforce) of the social dimension of CSR.

Benlemlih (2017:7) cites two studies by Girerd-Potin, Jimenez-Garcès and Louvet (2011:9) and Pijourlet (2013:1) that investigate a more direct association between CSR and firms' financing policies. Based on a sample of 322 non-financial European firms, Girerd-Potin et al. (2011:14) study the effect of social ratings as a determinant of capital structure. They develop a model based on the fact that equity financing is more expensive for firms that are not socially responsible, while debt finance is indifferent between firms that are socially responsible and those that are not. The author finds that firms that exhibit lower social ratings and are thus regarded as less socially responsible have higher or increasing levels of debt. Therefore, they are able to avoid penalties from the equity market through debt financing since debt is considered to be socially neutral and hence mitigates the need for firms to adopt investor's concerns regarding CSR. They conclude that the increasing importance of CSR does have an impact on a firm's financing decisions. Similarly, using a global sample of 5859 firm-year observations, Pijourlet (2013:2) also finds that high CSR firms have lower debt ratios and tend to issue larger amounts of equity than low CSR firms. Furthermore, the inverse relationship between leverage and social and environmental performance is only found to be significant for the social performance factor. The authors state that the results imply that high levels of CSR performance reduce information asymmetry and make it easier for firms to access equity markets, which in turn encourages them to issue more equity at lower costs of capital. Overall, they conclude that firms' capital decisions are determined to some extent by the level of their CSR performance and can thus be instrumental in reducing their reliance on market conditions for equity issuances. According to Benlemlih (2017:7), the findings from these studies demonstrate that the level of CSR can influence the capital structure of firms.

2.4 Research Hypotheses

The theories and empirical research studies presented thus far suggest that CSR has financing implications for firms. Specifically, they suggest that socially responsible firms are likely to be less leveraged than socially irresponsible firms as they have access to lower costs of equity capital from the lower perceived risk and informational asymmetries associated with better CSR performance and reporting. In addition, greater voluntary disclosure is associated with more effective capital allocation and better investment decisions (La Rosa, 2019:520). Although the findings from these studies have been drawn from non-financial firms, further evidence provided by Gropp and Heirder (2010:587) and Teixeira et al. (2014:34) suggest that factors that explain the capital structure of non-financial firms also explain banks' capital structures, thus applying this criterion to the banking industry, socially responsible banks are expected to be less leveraged than banks that are less socially responsible. Since the GFC, the perceptions of stakeholders regarding risk and performance have turned out to be increasingly relevant to banks due to their reliance on depositors and the public sector as key sources of funding and also due to the risk aversion of investors (Jizi et al., 2014:602). It is thus presumed that the positive impact of good CSR performance on stakeholder relationships also generates a conducive environment for banks to issue equity. Therefore, the following null hypothesis and alternative hypothesis may be formulated regarding the capital structures of banks:

H_0: There is no relationship between the CSR and leverage of banks.

H_1: The relationship between the CSR and leverage of banks is negative.

The Basel Committee (2013:3) also notes that the recent GFC was triggered by the failure and impairment of several large banks. Moreover, Chih, Chih and Chen (2010:117) suggest that larger financial firms are likely to be more socially responsible as they are subject to stricter public scrutiny. Likewise, Wu and Shen (2013:3537) argue that larger banks are more involved in CSR activities as they are better-resourced to do so. The importance of bank stability goes hand in hand with the size of banks and since the activities and decisions of larger banks have been observed to have wider-reaching consequences, it would be beneficial to examine if the size of banks influences the relationship between CSR and bank leverage. Therefore, a second alternative hypothesis may be formulated as follows;

H_2: Bank size influences the predicted relationship between CSR and bank leverage.

Section 3: Methodology

This section outlines the research approach chosen to address the research questions posed in section 1 as well as the sample, variables and data used to conduct the study. The methodology and related analysis are also discussed.

3.1 Research Approach

An essential part of any research study involves the selection of an appropriate research approach. The choice is dependent on the research question and is usually between two widely used approaches; quantitative research and qualitative research, or a combination of both. Qualitative research is typically exploratory in nature and attempts to develop a theory from the results of the research based on reasonable forms of logic. In addition, the data collected is non-numeric and often collected through methods such as questionnaires, interviews, observations and focus groups (Saunders, Lewis & Thornhill, 2009:52). Quantitative research, on the other hand, tests existing theory to data using mathematical models and statistical techniques in order to predict, explain or understand the relationships between pre-determined variables (Yilmaz, 2013:311). The development of hypotheses from existing literature means that the results produced either support or invalidate the research study. Since this study seeks to confirm the hypotheses formulated in the previous section and examine the relationship among selected variables, it adopts the quantitative research approach. This approach provides the benefit of objective results that can potentially be generalised to the rest of the banking industry in future and thus make a valuable contribution to existing literature on bank capital structure. Furthermore, the use of quantitative research in this study is consistent with the methods used in most research in finance, particularly those that have investigated the determinants of capital structure.

3.2 Data and Sample Selection

This study examines whether CSR is a determinant of bank capital structure as suggested by previous theories and empirical works. To conduct the study, the required data is obtained from the Thomson Reuters Datastream, Bloomberg and World Bank databases, for the period 2009 to 2018. The selected years allow for the examination of the period immediately after the GFC, which is especially relevant since it corresponds with the period during which concerns about the social performance of the banking industry escalated. The sample adopted for the study consists of all the banks classified as G-SIBs due to their importance from a financial system stability, economic development and more recently sustainability perspective. As discussed in

previous sections, the resilience and ability of these institutions to deal with shocks has significant implications for the proper functioning of the broader financial and economic systems. This explains why the regulatory framework includes special and additional provisions for these banks. Based on this rationale and in accordance with Gropp and Heider's use of a sample of large systematically relevant commercial banks, the selected sample is considered to be more meaningful for the study than a random sample of banks. Every year in the month of November, the Financial Stability Board publishes an updated list of G-SIBs in consultation with national authorities and the BCBS (Financial Stability Board, 2018:1). As at November 2018, 29 banking institutions were identified as G-SIBs. However, due to absence of CSR data for one of the banks (Groupe BPCE), only 28 of these banks make up the sample for the study. Although the sample size of 28 might be considered to be small, the combined assets of the G-SIBs account for a majority of the global banking activity. In addition, the selected sample is deemed appropriate for the purposes of this study as it is largely interested on the CSR activities of banks that have a significant impact on society.

The designation of a bank as a G-SIB depends on the indicator-based measurement approach developed by the BCBS (BCBS, 2013:5). This approach is based on a framework of 5 quantitative indicators that reflect the various aspects of the contributions to systemic risk and the adverse implications that result from bank impairments or failures. These indicators are briefly discussed below as described by the BCBS (BCBS, 2013:7);

- **Size of the bank**

Large banks typically engage in more global activities, hence any disruptions in their operation are likely to have greater systemic impacts. This is because the larger the bank, the more difficult it will be for other banks to swiftly replace its service offering which raises the probability that its distress or failure will interrupt the proper functioning of wider financial system. As witnessed during and after the GFC, another possible consequence of the distress of a large bank is the loss of public trust in the stability of financial system as a whole, increasing the likelihood of a run on deposits and placing the entire financial system in distress.

- **Interconnectedness of the bank with other financial institutions**

The failure of single bank can be a source of systemic risk due to its connection with other banks and financial institutions. This is mainly through the contractual obligations related to intra-financial system assets and liabilities as well as the provision of payment and settlement services to other institutions in the financial markets. The degree of interdependence among

banking and other financial firms thus determines the financial system's ability to withstand any shocks and subsequent disruptions.

- **Complexity of the bank and its operations**

The systemic risk posed by the distress or failure of banks is also influenced by the complexity of their business models, structures and activities. Banks often perform/take on multiple activities simultaneously (e.g. commercial banking, insurance and investment/asset management) and engage in complex derivative and trading activities that make them vulnerable to exposures from movements in the market. Since they also operate in several countries via branches and subsidiaries, they may be subject to different regulatory and legal frameworks, adding to the complexity of their organisational structures and business models. The more complex the bank's structures and operations, the greater the resources required to rescue them from distress and the greater the chances that the distress will spread to the rest of the financial system.

- **Substitutability of the financial services and products provided by the bank**

Substitutability refers to the extent to which the financial infrastructure, services and products provided by a bank in distress can be taken on or replicated by other banks. The goal is to lessen disruption to the financial market from the withdrawal of a key market participant as well as the tapered flow of market liquidity caused by banks that play a greater role in providing essential services related to payments activity and underwriting transactions in capital markets. The less substitutable a bank's functions are, the more systemically important it is, especially if these functions are deemed to be critical to the stability of the wider financial system and the functioning of the global economy.

- **Global/ cross-jurisdictional activity**

The globalisation of the banking system also means that the impact of a bank's failure can be easily transmitted to the rest of the international financial system. This is particularly true for banks that have a greater global footprint and thus a greater share of cross-jurisdictional assets and liabilities as the spill over effects from their failures are likely to be more material and widespread. In addition, a higher level of engagement in global activities reduces the chances of a timely resolution of a distressed bank as well as the capacity to limit the adverse effects of bank failures. Among the 29 G-SIBs, 7 are located in Asia, 13 in Europe and 9 in North-America. The geographical dispersion of these institutions emphasises the wider potential consequences that could arise from the failure of any one of these banks due to the interlinkages

that exist between internationally active banks. A list of these banks together with a breakdown by country and region is presented on Table 2.

Altogether, these indicators are key measures of systemic importance and therefore, make G-SIBs a particularly interesting universe. The BCBS (2013:5) acknowledges that it may be difficult to quantify the systemic impacts of these indicators before the fact and so it allows for supervisory judgement based on qualitative information. However, such judgement is only permissible in exceptional cases and is subject to international peer review.

Table 2: List of G-SIBs as at November 2018

Bank Name	**Country of Origin**	**Region**
Agricultural Bank of China Bank of China China Construction Bank Industrial & Commercial Bank of China	China	**Asia-Pacific (7)**
Mitsubishi UFJ FG Mizuho FG Sumitomo Mitsui FG	Japan	
Barclays HSBC Standard Chartered	United Kingdom	**Europe (13)**
BNP Paribas Groupe BPCE Groupe Crédit Agricole Société Générale	France	
Deutsche Bank	Germany	
UniCredit Group	Italy	
ING Bank	Netherlands	
Santander	Spain	
Credit Suisse UBS	Switzerland	
Bank of America Bank of New York Mellon Citigroup Goldman Sachs JP Morgan Chase Morgan Stanley State Street Wells Fargo	USA	**North America (9)**
Royal Bank of Canada	Canada	

Source: Compiled using the published list of G-SIBs as at November 16, 2018

The following sub-section outlines the variables and statistical model applied in analysing the data collected.

3.3 Measurement of Variables and Research Model

Variables

The variables used in this study are limited to those used in recent empirical studies on bank capital structure. In line with common practise in capital structure research, leverage is used as the dependent variable to define capital structure. The use of leverage as the dependent variable is appropriate as it includes non-debt liabilities such as bank deposits. According to Gropp and Heider (2010:598), leverage can either be measured in terms of book value or market value and although both measures have been used interchangeably in previous capital structure studies and yielded similar results, the distinction between market and book bank leverage is especially important for banks since regulation is imposed on book bank capital. Nonetheless, the authors find that the difference between market and book bank leverage is insignificant (Gropp & Heider, 2010:600). This is also consistent with Teixeira et al. (2014:44)'s assertions about the negligible difference between market and book bank leverage. In this study, leverage is measured in market values as it has the advantage of being forward-looking (Frank & Goyal, 2009:2).

The key independent variable in this study is CSR. Various proxy measures for CSR have been used in prior empirical research studies as noted in the previous discussion on CSR, however, environmental, social and governance (ESG) disclosure scores or ratings are generally used as proxies for CSR (Esteban-Sanchez et al., 2017:1103). Following Esteban-Sanchez et al. (2017:1103) who use the equal-weighted Datastream ASSET4 ratings, this study adopts the Refinitiv Datastream ESG scores which replaced the ASSET4 ratings that were phased out in 2018 (Refinitiv, 2019:3). Refinitiv Datastream ESG scores rank firms based on public data reported by companies on their performance across the three ESG dimensions and according to ten main categories that correspond with each of these dimensions. The ten categories and their descriptions are presented on Appendix 1. Company data used to generate the scores is sourced from firms' annual reports, stock exchange filings, CSR reports and news media (Refinitiv, 2019:3).

There are two overall ESG scores; the ***ESG Score*** measures firms' CSR performance based on public company-reported disclosures while the ***ESG Combined Score (ESGC)*** links the basic ESG Score with any material ESG controversies reported in the media. In the absence of ESG controversies, both scores are equal. Scores are reported both in percentages from 0 to 100 and letter grades that range from A+ to D-. The higher the ESG score in percentage terms or letter

grade, the more socially responsible a firm is assumed to be. In this study, the social responsibility quality of a bank is measured by the ESG Score since it measures the overall degree of banks' transparency through voluntary disclosures and is also consistent measure to use across all banks. The former ASSET4 ratings have been used in several other empirical studies such as Ioannou and Serafeim (2012:844), Cheng, Ioannou and Serafeim (2014:6), Stellner, Klein and Zwergel (2015:542) and La Rosa et al. (2018:523) as a measure for CSR.

Following existing work on bank capital structure determinants and in particular Gropp and Heider (2010:596), additional independent variables include bank size, profitability, tangibility, growth, dividends, asset risk and tax. These variables represent a set of factors that have been observed to explain the capital structure of banks and are thus used to control for the various effects that might confound the relationship between CSR and bank leverage. Their effect on leverage has already been explained under section 2.1.2. Furthermore, Teixeira et al. (2014:38) note that is it important to control for macroeconomic variables as banks are presumed to be highly exposed to the economic activities in their respective countries considering the roles they play in economic and financial systems. Consequently, the study includes gross domestic product (GDP) growth and inflation data obtained from the World Bank database as further explanatory variables. Table 3 provides a summary of all the variables used in the study, including their measures, sources of data and their expected relationship with bank leverage according to the predictions of literature on bank capital structure.

Table 3: Summary of Variables Used in the study

Variables	Measure	Data Source	Expected effect on LEV
Dependent Variables			
Leverage (LEV)	1 minus (market value of equity/market value of assets)	Computed using data obtained from Bloomberg	N/A
Key Independent Variable			
CSR (CSR)	ESG Score	Datastream	-
ESG Dimensions:			
Environmental (ENV)	Environment Dimension Score		
Social (SOC)	Social Dimension Score		
Corporate Governance (GOV)	Governance Dimension Score		
Control Variables			
Bank-specific factors:			
Bank Size (SIZE)	Natural log of book value of total assets	Computed using data obtained from Bloomberg	+
Profitability (PROF)	Return on assets (pre-tax profits + interest expenses over the book value of assets)		-
Asset tangibility (TANG)	Ratio of tangible assets to total assets		+
Growth (GROWTH)	Ratio of market-to-book value of assets		-

Asset risk (ARISK)	Annualized standard deviation of daily stock returns * (market value of equity/market value of the bank)	Computed using data obtained from Bloomberg	-
Taxation (TAX)	Effective tax rate		+
Dividend Payment (DIV)- Dummy variable	Assumes a value of 1 if the bank paid dividends in a given year, and 0 otherwise		-
Macroeconomic variables:			
GDP Growth (GDP)	Annual % change in GDP	World Bank	+
Inflation (INF)	Annual % change in average CPI		

Source: Author's own

Econometric Model

To examine the link between CSR and bank capital structure, this study employs a multiple regression analysis of panel data based on 280 bank-year observations. The use of panel data allows for the control of variables that cannot be measured or observed in strictly cross-section or time series data and helps to account for the heterogeneity that typically exists in panel data (de Jager, 2008:56). There are two estimation techniques that can be used to model panel data; the Fixed Effects (FE) or Random Effects (RE) models. The FE model assumes that unobserved variables and observed variables are associated, whereas the RE model assumes that unobserved variables are not correlated with the observable variables. The Durbin-Wu Hausman specification test (Hausman test) will be used to determine which of the two models is more appropriate to apply to the data. In addition, as in Gropp and Heider (2010:596) and Teixeira et al. (2014:36), a lag of one year between bank leverage and all the explanatory variables, except the dividend dummy and macroeconomic variables, is applied to address any endogeneity issues. This means that bank leverage data was collected from 2010 to 2018, while data for the independent variables was gathered from 2009 to 2017.

Following Sorokina (2017:36) and based on previous standard capital structure research, a new financial management model is proposed that includes CSR as an explanatory variable of bank capital structure in addition to the traditional explanatory variables. Two separate regression models are used to test the hypotheses formulated in this study. The first model tests the null (H_0) and first alternative hypotheses (H_1), while the second model tests the second alternative hypothesis (H_2). To test H_2, the first model is modified to interact the CSR and size variables to capture the effect of bank size on the relationship predicted under H_1. A significant result for the interacting variables will support this hypothesis. Furthermore, the link between CSR and bank leverage is further analysed by disaggregating the CSR variable in both models (represented by the ESG score) into its component parts.

The models are thus defined as:

$$LEV_{ict} = \beta_0 + \beta_1 CSR_{ict-1} + \beta_2 \ln(SIZE)_{ict-1} + \beta_3 PROF_{ict-1} + \beta_4 TANG_{ict-1} + \beta_5 GROWTH_{ict-1} + \beta_6 ARISK_{ict-1} + \beta_7 DIV_{ict} + \beta_8 TAX_{ict-1} + \beta_9 GDP_{ict} + \beta_{10} INF_{ict} + \mu_{ict} \quad \text{(Model 1)}$$

$$LEV_{ict} = \beta_0 + \beta_1 CSR_{ict-1} + \beta_2 \ln(SIZE)_{ict-1} + \beta_3 PROF_{ict-1} + \beta_4 TANG_{ict-1} + \beta_5 GROWTH_{ict-1} + \beta_6 ARISK_{ict-1} + \beta_7 DIV_{ict} + \beta_8 TAX_{ict-1} + \beta_9 GDP_{ict} + \beta_{10} INF_{ict} + \beta_{11} CSR*SIZE_{ict} + \mu_{ict} \quad \text{(Model 2)}$$

Where β_0 is the constant term, βn is the coefficient of independent variables and the subscripts i, c, and t denote the i^{th} bank in the c^{th} country at time t, respectively. X_{ict-1} represents a set of one-year lagged bank-specific factors and μ_{ict} is the error term. The equations of the models will be estimated using Stata 15 Statistical Analysis Software. The results and related discussions are presented in the next section.

Section 4: Results and Analysis

This section presents the results of the econometric models described in the methodology section. An analysis of the descriptive statistics and correlations among the variables used in the study is undertaken before the results are discussed.

4.1 Descriptive Statistics

A summary of the descriptive statistics for bank leverage, CSR and the control variables are provided in Table 4 below.

Table 4: Descriptive statistics

Variable	N	Mean	Standard Deviation	Minimum	Median	Maximum
LEV	279	0.9474	0.0328	0.8597	0.9544	0.9951
CSR	277	0.7681	0.1237	0.3000	0.7900	0.9500
SIZE	280	14.8556	1.8124	11.9700	14.2471	19.5422
PROF	280	0.0179	0.0107	-0.0076	0.0159	0.0744
TANG	280	0.9875	0.0147	0.8971	0.9929	0.9999
GROWTH	279	0.9835	0.0210	0.9170	0.9789	1.0517
ARISK	278	0.0155	0.0137	0.0029	0.0118	0.1393
DIV	280	0.8786	0.3272	0	1	1
TAX	249	0.3447	0.7373	0.0009	0.2549	11.3458
GDP	280	0.0332	0.1129	-0.0562	0.0184	0.9400
INF	280	0.0137	0.0123	-0.0135	0.0151	0.0555

Note: LEV=Leverage; CSR=Corporate Social Responsibility; SIZE= Bank Size; PROF=Profitability; TANG= Asset Tangibility; GROWTH=Bank Growth; ARISK= Asset Risk; DIV= Dividend Dummy; TAX= Taxation; GDP= Gross Domestic Product; INF= Inflation.

A review of the descriptive statistics shows that the average leverage of the banks in the sample is 94.74%, with a minimum leverage of 85.97 % and a maximum leverage of 99.51% indicating that in one year, one of the banks was almost entirely financed by debt. The corresponding standard deviation of 0.0328 suggests that most leverage values are relatively close to the average. This is consistent with the expectation and common observation of a highly leveraged banking industry as presented on Appendix 2 which shows the average leverage ratios of the G-SIBs over the sample period. In terms of size, the average bank size during the period under review was 14.86. The standard deviation of 1.8 for this control variable suggests that the sample exhibits some variation in the size of the banks despite the selection of G-SIBs that are generally assumed to be too big to fail. However, it is important to note that the designation of a bank as a G-SIB is not solely based on its size but also on the other four factors discussed in the methodology section. This may explain the dispersion in the size of the banks. Bank size is considered to be important in the study since it is expected to influence the predicted relationship between CSR and bank leverage.

Regarding profitability, the sampled banks exhibited an average return on assets of 1.79% during the years 2009 to 2018, with a minimum and maximum return on assets of -0.76% and 7.44%, respectively. The average asset risk was 1.55%, with a standard deviation of 0.0137 and a minimum and maximum assets risk of 1.18% and 13.93%, respectively. The statistics on profitability and asset risk suggest that the G-SIBs experienced low and relatively stable returns during the sample period. The asset structure of the banks in the sample was represented by an average of 98.7% implying that a majority of bank book assets are made up of tangible assets. The standard deviation of 0.015 further implies that this is true for most of the banks. Furthermore, the average market-to-book ratio, which measures the growth potential of the banks, was 0.9835, with a minimum of 0.917 and a maximum of 1.052. This indicates that in general these banks' market values are close to the book value of their assets and hence the lower growth that is expected by the markets.

Further review of the descriptive statistics indicates that there was data missing for some of the independent variables used in the study. With regards to the leverage, CSR, growth and asset risk variables the missing data pertains to the listing of Agricultural Bank of China in August 2010, hence no market data was available before then to compute the relevant measures. Much of the missing data was in relation to the tax variable due to data unavailability. It is important to note that missing data has the potential to reduce the statistical power of a study and can produce biased regression estimates that affect the validity of the conclusions reached.

However, since the data used in the study is missing completely at random, the estimated parameters were not biased by the absence of the data.

As the main variable of interest in this study, the average ESG score of the G-SIBs in the sample (which is a proxy for CSR) was 76.81%, with a minimum and maximum of 30% and 95%, respectively. The standard deviation of 0.1237 indicates that the reported scores of the banks are not too far off from each other. Given the objective of this study and reliance on ESG scores to predict the relationship between banks' level of CSR commitment and leverage, it is useful to further analyse the ESG scores by comparing the summary statistics of the individual scores of the three dimensions that make up the combined ESG scores. These statistics are summarised in Table 5 below.

Table 5: Summary Statistics of ESG Scores

ESG Dimension	N	Mean	Standard Deviation	Minimum	Median	Maximum
Environmental	277	0.8553	0.1137	0.4000	0.8900	0.9900
Social	277	0.7605	0.1691	0.1600	0.7900	0.9800
Governance	277	0.6797	0.1747	0.1700	0.7300	0.9600

The average scores of the individual ESG dimensions appear to be fairly close to each other, with the governance dimension exhibiting a lower average score than the other two dimensions. In addition, it appears that the G-SIBs score higher on the environmental dimension. This suggests that, in general, G-SIBs score best in the environmental dimension and worst in the governance dimension. It is also evident that both the social and governance scores exhibit the lowest reported scores compared to the environmental dimension. Overall, based on the standard deviations, all three dimensions have moderately low variation in their scores.

4.2 Correlation Analysis

The correlation matrix provided on Table 6 shows the correlations between bank leverage (dependent variable) and the pre-specified explanatory variables. A review of the correlations allows for an analysis of the strength and direction of the relationship between these variables as well as the identification of any multicollinearity issues among the independent variables.

Table 6: Correlation Matrix (Pearson)

Variables	LEV	CSR	SIZE	PROF	TANG	GRWTH	ARISK	DIV	TAX	GDP	INF
LEV	1										
CSR	-0.043	1									
SIZE	0.339***	-0.475***	1								
PROF	-0.217***	-0.230***	-0.144	1							
TANG	0.529***	-0.258***	0.489***	0.164***	1						
GROWTH	-0.700***	0.077	-0.255***	0.236***	-0.180**	1					
ARISK	-0.587***	0.087	-0.324***	0.157	-0.451***	0.346***	1				
DIV	-0.375***	-0.193**	0.151**	0.172	-0.124**	0.201***	0.228***	1			
TAX	0.106*	-0.082	0.114*	-0.151**	0.057	-0.051	-0.050	0.001	1		
GDP	-0.192***	-0.437***	0.223***	0.306***	0.221***	0.149***	-0.181***	0.152**	-0.223***	1	
INF	-0.114**	-0.172***	-0.131	0.279***	-0.019	-0.023	-0.118**	0.117*	-0.178***	0.373***	1

*Note: ***, ** and * denotes significance at 1%, 5% and 10%, respectively.*

The main correlation between bank leverage and CSR is negative, providing preliminary support for the direction of the relationship between the two variables as predicted in the first hypothesis. The correlation coefficient of -0.043 is, however, statistically insignificant, implying that there is no correlation between CSR and the leverage of the G-SIBs. A graphical representation of this correlation is presented on Appendix 3. It can be observed that the line of best fit on the scatter graph is only slightly negative. A significant negative correlation between CSR and size can also be observed, which implies that the larger the bank the lower its ESG disclosure score. This may have implications for the interaction term between the two variables under the second hypothesis. Overall, the signs of the coefficients and the correlations between bank leverage and the control variables are consistent with those findings typically observed in standard capital structure literature.

Based on the correlation matrix above, there appears to be no multicollinearity issues. Multicollinearity refers to a situation in which the independent variables in a multiple regression model are highly correlated with one or more other independent variables, weakening the statistical significance of those variables due to large standard errors. Most of the independent variables in the matrix only exhibit weak correlations with each other. The highest correlations are between size and tangibility and between size and CSR with values of 0.489 and 0.475, respectively. However, these correlations are not high enough to give rise to any multicollinearity problems or warrant corrective measures. To provide further evidence of the absence of multicollinearity, variance inflation factors (VIF) are used to test for multicollinearity. VIF measures the level of collinearity between explanatory variables in a

regression model. As a rule of thumb, a VIF of 5 or less indicates that there is no multicollinearity between the explanatory variables used in the regression model. The results of the multicollinearity test presented on Appendix 4 confirm that the models used in the study do not suffer from multicollinearity.

The next subsection discusses the results of the regression models.

4.3 Regression Results

Tables 7 and 8 below show the results of the regressions on the determinants of bank capital structure for the specified regression models. These models were estimated using the Pooled Ordinary Least Squares (OLS) and FE regression techniques. For the Pooled OLS models, the Ramsey Regression Equation Specification Error Test (Ramsey-RESET) for omitted variable bias indicated that there were unobserved individual effects as the null hypothesis of no omitted variables was rejected as deduced from the test statistic of 13.48 which was significant at the 1% level (refer to Appendix 5).

In order to improve the robustness of the Pooled OLS regression results, it was necessary to estimate other variations of panel data techniques, namely the FE and RE techniques, that would provide a better fit for the data. Regression diagnostics under both techniques suggest that the estimated results are statistically significant in explaining the determinants of bank capital structure. Specifically, the F-test statistics (under the FE model) and Wald test statistics (under the RE model) were significant at the 1% level across all the models (refer to Appendix 5). These techniques are thus considered to be more appropriate than the Pooled OLS technique. The Hausman test was employed to determine which model to use between FE and RE, as shown on Appendix 6. A large and significant Hausman test statistic value means that there is a large difference between the RE and FE estimators and so the null hypothesis is rejected in favour of the alternative hypothesis. The Hausman test statistic value of 96.44 was significant at the 1% level, hence the null hypothesis was rejected, favouring the use of the FE technique. Furthermore, like Gropp and Heider (2010:596), robust standard errors clustered at the bank level were used to account for heteroskedasticity and autocorrelation.

4.3.1 Results from Regression Model 1

Table 7: Fixed Effects (FE) Regression results for Model 1

EXPLANATORY VARIABLES	DEPENDENT VARIABLE (LEVERAGE)	
	Model 1	**Model 1(a)**
Constant	2.201***	2.170***
	(0.265)	(0.273)
CSR	-0.0299	-
	(0.0230)	
ENV	-	-0.00260
		(0.0198)
SOC	-	0.0126
		(0.0151)
GOV	-	-0.0229**
		(0.00982)
SIZE	-0.000517	-0.00385
	(0.00903)	(0.00993)
PROF	0.317	0.394
	(0.256)	(0.239)
TANG	-0.926***	-0.873***
	(0.286)	(0.281)
GROWTH	-0.318***	-0.304***
	(0.109)	(0.103)
ARISK	-0.184**	-0.197**
	(0.0832)	(0.0741)
DIV	-0.00769***	-0.00873***
	(0.00216)	(0.00215)
TAX	0.00105**	0.0241
	(0.000419)	(0.0471)
GDP	0.0265	0.00100**
	(0.0486)	(0.000404)
INF	0.382***	0.363***
	(0.109)	(0.107)
R-squared	0.329	0.343
F [prob.]	24.17 [0.0000]	26.43 [0.0000]
Number of banks	28	28
Number of observations	220	220

*Clustered standard errors in parentheses (); ***, ** and * denotes significance at 1%, 5% and 10%, respectively. Note: ENV= Environment Dimension Score, SOC= Social Dimension Score and GOV = Governance Dimension Score. For Model 1(a),* $LEV_{ict} = \beta_0 + \beta_1 ENV_{ict-1} + \beta_2 SOC_{ict-1} + \beta_3 GOV_{ict-1} + \beta_4 ln(SIZE)_{ict-1} + \beta_5 PROF_{ict-1} + \beta_6 TANG_{ict-1} + \beta_7 GROWTH_{ict-1} + \beta_8 ARISK_{ict-1} + \beta_9 DIV_{ict} + \beta_{10} TAX_{ict-1} + \beta_{11} GDP_{ict} + \beta_{12} INF_{ict} + \mu_{ict}$

The results from Model 1 show that CSR has a negative but insignificant impact on the leverage of the banks in the sample. While the negative sign of the coefficient supports the expected direction of the relationship between CSR and bank leverage, the null hypothesis that there is no relationship between CSR and bank leverage cannot be rejected due to the lack of statistical significance. Moreover, the low estimated coefficient of -0.03 suggests that CSR performance accounts for very little, if any, of the variation in bank leverage. A possible explanation for the weak significance of the CSR coefficient could arise from the measurement of CSR using the aggregate score. It could be that the banks perhaps respond to specific social concerns. Therefore, in order to gain a better understanding of the relationship between CSR and leverage, the ESG Scores used as the CSR proxy in Model 1 were substituted by the scores of the individual ESG dimensions, that is, the ENV, SOC and GOV scores. This allowed for an analysis of the ESG dimensions that banks are likely to account for in their capital structure decisions. The results of the disaggregated ESG Scores are presented in Table 7 under Model 1(a). The results show that, although the coefficients of the environmental and social dimensions remain insignificant, the sign of the coefficient between the governance dimension and bank leverage is negative and statistically significant at 5%. Moreover, only the governance and environmental dimensions produce the predicted negative sign of the coefficient.

Further review of the coefficients of the control variables used in Model 1 shows that most of the explanatory variables considered show statistical significance which is consistent with the recent literature on bank capital structure. Tangibility, growth, dividend dummy and inflation are significant at 1%, while asset risk and tax are significant at the 5% level. These variables retain their statistical significance under Model 1(a), except for tax, and GDP becomes significant at the 5% level. In addition, all the coefficients have the expected sign, except for size, profitability and tangibility. However, the coefficients of the size and profitability variables are insignificant, hence no reasonable conclusion can be drawn regarding their relation to leverage. The negative coefficient of the tangibility variable is consistent with the pecking order theory. Overall, the explanatory variables included in the regression models collectively account for roughly a third of the change in bank leverage, based on the R-squares of 32.9% (Model 1) and 34.3% (Model 1(a)). This suggests that regulation is not the sole determinant of bank capital structure. This is further supported by the F-tests on the joint significance of all the explanatory variables on bank leverage which generate statistical significance at the 1% level.

4.3.2 Results from Regression Model 2

The results from Model 2 regarding the second hypothesis are shown in Table 8 below.

Table 8: Fixed Effects (FE) Regression results for Model 2

EXPLANATORY VARIABLES	DEPENDENT VARIABLE LEVERAGE	
	Model 2	**Model 2(a)**
Constant	2.253***	2.196***
	(0.277)	(0.298)
CSR	-0.0244	-
	(0.0191)	
ENV	-	-0.00917
		(0.0266)
SOC	-	0.0208
		(0.0162)
GOV	-	-0.0194**
		(0.00791)
SIZE	-0.00114	-0.00402
	(0.0109)	(0.0116)
PROF	0.323	0.384
	(0.244)	(0.231)
TANG	-0.947***	-0.877***
	(0.291)	(0.298)
GROWTH	-0.337***	-0.322**
	(0.119)	(0.116)
ARISK	-0.179**	-0.205**
	(0.0849)	(0.0831)
DIV	-0.00786***	-0.00987***
	(0.00242)	(0.00306)
TAX	0.00101**	0.0429
	(0.000419)	(0.0656)
GDP	0.0248	0.00105**
	(0.0505)	(0.000499)
INF	0.354***	0.349***
	(0.104)	(0.115)
CSR*SIZE	-0.000582	-
	(0.00117)	
ENV*SIZE		0.000707
		(0.00152)
SOC*SIZE		-0.000541
		(0.000835)
GOV*SIZE		-0.000722
		(0.00109)
R-squared	0.343	0.362
F [prob.]	20.65 [0.0000]	54.19 [0.0000]
Number of banks	28	28
Number of observations	220	220

*Clustered standard errors in parentheses (); ***, ** and * denotes significance at 1%, 5% and 10%, respectively.*
For Model 2(a), $LEV_{ict} = \beta_0 + \beta_1 ENV_{ict-1} + \beta_2 SOC_{ict-1} + \beta_3 GOV_{ict-1} + \beta_4 ln(SIZE)_{ict-1} + \beta_5 PROF_{ict-1} + \beta_6 TANG_{ict-1} + \beta_7 GROWTH_{ict-1} + \beta_8 ARISK_{ict-1} + \beta_9 DIV_{ict} + \beta_{10} TAX_{ict-1} + \beta_{11} GDP_{ict} + \beta_{12} INF_{ict} + \beta_{13} ENV*SIZE_{ict} + \beta_{14} SOC*SIZE_{ict} + \beta_{15} GOV*SIZE_{ict} + \mu_{ict}$

Model 2 includes an interaction term between CSR and bank size to identify any interaction effects between the two variables. The results show that there is an insignificant interaction between CSR and size when CSR is measured in aggregate terms. As in Model 1, each of the three ESG dimensions is interacted with the size variable to produce the results in Model 2(a), however, insignificant interactions are still found between each of the ESG dimensions and size. This implies that the size of a bank has no effect on the link between CSR and leverage and thus invalidates the second hypothesis. Nevertheless, the inclusion of the interaction terms between the ESG dimensions and size does not change the direction and significance of the relationships observed in Models 1 and 1(a) as most of them remain stable. Most importantly, the negative and significant relationship between the governance dimension and bank leverage also remains intact. The next subsection discusses the implications of the observed results.

4.4 Discussion of Results

The first hypothesis predicted an inverse relation between CSR and leverage. The regression results on Table 7 are inconsistent with Pijourlet (2013:17) who finds a significant negative relationship between the two variables using the aggregate CSR score. Similarly, Girerd-Potin (2011:34) initially find an insignificant negative relation, but after accounting for the distribution in the aggregate social rating their results become significant.

Further analysis of the individual CSR dimensions does reveal, however, that there is a significant negative relationship between the governance dimension of the ESG score and bank leverage. This is not surprising given that under the Refinitiv ESG scoring methodology, the specific CSR strategies of companies are reflected in the governance dimension score (see Appendix 1). According to the methodology, the governance dimension reflects a company's actions to communicate that it integrates social responsibility into its daily operations and decision-making processes (Refinitiv, 2019:16). Interestingly, Laeven (2013:65) also notes that the recent GFC has been linked to failures and weaknesses in the governance systems of banks, particularly with regards to their risk management processes. The results obtained thus make intuitive sense and imply that the governance dimension could be more relevant for banks than the other two dimensions. A similar assertion is made by Pijourlet (2013:17) who, after failing to obtain a significant result between the environment dimension and leverage, states that investors may be less concerned about environmental policies than assumed. Overall, the results suggest that banks with sound governance systems will be less leveraged than banks with poor governance practices in place.

The link established between the governance structures of banks and capital structure could be instrumental in restoring public confidence in the banking system. As previously pointed out by Wu and Shen (2013:3531), CSR can be linked to banks through their reputations. Good governance systems encourage corporate accountability and greater transparency which in turn have a beneficial influence on the reputation of banks and their relations with stakeholders. Moreover, greater transparency reduces informational asymmetries between a firm's insiders and its external stakeholders which allows for better communication and thus helps banks to remain reputable (Cui, Jo & Na, 2018:549). According to Berger, Imbierowicz and Rauch (2016:731) effective governance systems are also useful in predicting bank failures. Therefore, the observed relationship could help to reduce the risk of another financial crisis through sound risk management processes that control for excessive risk taking by banks, especially those that are deemed to be systemically important. Since overleverage in the banking sector is viewed as a key risk to financial and economic stability, such governance systems could be a safeguard for the economy and society.

However, it should be noted that the estimated coefficient values of the governance variable suggest that it has less explanatory power than most of control variables included in the regression models. A possible reason is provided by Girerd-Potin et al. (2011:36) who argue that the application of the CSR concept to the capital markets is a relatively recent phenomenon and since current leverage levels are the result of past capital structure decisions and evolve rather slowly, it will take time for CSR strategies to be fully reflected in capital structures. It could thus be deduced that as banks continue to address societal concerns about the overleveraged banking industry by adjusting their capital structures, governance and perhaps even aggregate CSR will have greater explanatory power for future leverage levels.

This study was unable to find significant relationships between the environment and social dimension with bank leverage. The lack of an environment-leverage relation is in accordance with Pijourlet (2013:17), as mentioned above, and Girerd-Potin (2011:43) who note that although the results are surprising, it could be that investors are sacrificing environmentally conscious firms for firms that are more socially inclined. However, Sharfman and Wood (2008:570) find a negative environment-leverage relationship and claim that adequate environmental risk management lowers the cost of equity which makes equity financing more appealing. In terms of the social dimension, Bae et al. (2011:130) find that firms that are committed to fair employee treatment are less leveraged. Although they only focus on the

workforce aspect of the social dimension, their findings illustrate that the social dimension can be inversely related to leverage.

The second hypothesis sought to examine the influence of bank size on the predicted link between CSR and bank leverage. The insignificance of the interaction terms between the ESG scores and the individual ESG dimension scores with the size variable imply that banks that are more socially responsible are likely to be less leveraged irrespective of their size. However, Chih et al. (2010:124) argue that larger financial firms are expected to be more socially responsible since they are highly visible and so are naturally subject to greater public scrutiny. In addition, larger banks are thought to be better-resourced to engage in more CSR activities than their smaller counterparts and are therefore, expected to exercise better social responsibility. The finding from this study could be distorted by the fact that the G-SIBs used in the sample represent some of largest banks globally, so any interaction with the size variable is unlikely to produce the expected effect. Bank size is highly relevant to the stability of the banking system since the failure or distress of larger banks is likely to be more material than the failure of smaller banks, hence larger banks have more reason to be mindful of societal concerns regarding their capital structures and take these concerns into consideration in their capital decisions.

Overall, these results emphasise the increasingly important role of CSR in the banking industry and its relevance to the capital structures of banks.

Section 5: Conclusion

Guided by the increasing importance of CSR in the banking industry and the recent empirical findings on the applicability of the standard capital structure determinants to banks, this study set out to examine the capital structures of a sample of 28 G-SIBs, with a focus on CSR as a possible determinant of their capital structure. Based on the favourable influence of CSR on equity financing, the study hypothesised that the leverage of banks is inversely related to their CSR performance and that the size of banks influences this relationship. The results show that there is no relation between the aggregate measure of CSR and bank leverage which is inconsistent with the findings from previous empirical studies on the link between CSR and capital structure. However, when the CSR measure is unpacked further, a significant negative relation was only found between the governance dimension of CSR and bank leverage, suggesting that the governance dimension could be more important

for bank capital structures than the environmental and social dimensions. Overall, the finding suggests that, to some extent, CSR is indeed a determinant of the capital structure of G-SIBs and thus provides insight into how they are adapting to societal standards after the GFC. In spite of the greater public scrutiny of these banks, bank size was found to have no effect on the predicted relationship.

5.1 Contributions and Policy Implications

In recognising that knowledge about the CSR performance of banks as well the perception of their social responsibility is of interest to investors, customers and regulators, this study makes several contributions to the existing literature on CSR and bank capital structure. Firstly, by extending the works of Pijourlet (2013:1) and Girerd-Potin (2011:9), whose work focus on the impact of CSR on the financing decisions of non-financial firms, to banks, it highlights the growing importance of CSR in the banking industry and its potential role in restoring public trust in the banking system following the GFC. This is particularly important in this era where society is critical of how these large international banks conduct their activities. Secondly, the results provide further support for Gropp and Heider (2010:587) and Teixeira et al. (2014:34) who propose that the drivers of the capital structures of non-financial firms also determine that of banks and thus negate capital regulation as the sole determinant of their capital structures.

Lastly, the results of this study have important implications for the regulation of banks and especially, G-SIBs. Since the GFC, the BCBS has embarked on several reforms in an effort to enhance the resilience of the banking industry (BCBS, 2013:2), including higher capital requirements and the introduction of leverage ratios. The results of this study could be incorporated into these reforms, provided they are based on negotiation and mutual agreement between banks, regulators and other relevant stakeholders. This is because banks are likely to be more socially responsible if there are fair regulations in place to encourage such behaviour. This should help to improve bank stability and that of the wider financial system as well as prevent future financial crises. However, it is important to note that such policies rest on the recognition that commitment to CSR is the in the long-term interest of both the banking system and society at large.

5.2 Limitations of the Study and Areas for Further Research

This study relied on the use of ESG scores to measure the CSR performance of the G-SIBs. While Cho et al. (2013:74) acknowledge that third party CSR ratings are often used as an informative source when making investment decisions, it is important to note, however, that these ratings are disclosure oriented and do not necessarily reflect how firms actually perform in terms of CSR. Some banks may be inconsistent in their disclosure processes thus their CSR activities may not be captured in the ESG scores, reducing the reliability of the score as a measure of CSR. Furthermore, as argued by Aras et al. (2018:600), the concept of CSR is far too extensive in reality to be reduced to the three basic ESG dimensions. Certain aspects of CSR may be difficult to quantify therefore, it may not be possible to effectively measure the entirety of banks' CSR activities.

Nevertheless, the findings from this study suggest that there is scope for further research in the area of CSR and bank capital structure. Firstly, given that G-SIBs represent a unique universe of banks, the inclusion of other banks and financial institutions in the sample should help to clarify the applicability of the current research findings to the rest of the banking and financial services industry since they are also integral components of the wider financial system. The period beyond the GFC could also be extended to determine the extent of the explanatory power of CSR on bank capital structure. Secondly, it should be noted that the individual ESG dimensions are made of numerous aspects and each of these aspects could have a different impact on bank capital structure. Incorporating these different aspects into the analysis would provide more insight into the particular CSR issues that banks account for in their capital structure decisions.

Reference List

Aras, G., Tezcan, N. & Furtuna, O.K. 2018. Multidimensional comprehensive corporate sustainability performance evaluation model: Evidence from an emerging market banking sector. *Journal of Cleaner Production*. 185:600–609.

Bae, K.H., Kang, J.K. & Wang, J. 2011. Employee treatment and firm leverage: A test of the stakeholder theory of capital structure. *Journal of Financial Economics*. 100(1):130–153.

Barton, S.L., Hill, N.C. & Sundaram, S. 1989. An empirical test of stakeholder theory predictions of capital structure. *Financial Management.* 18(1):36-44.

Basel Committee on Banking Supervision. 2013. Global systemically important banks: updated assessment methodology and the higher loss absorbency requirement. Basel: Basel Committeeon Banking Supervision. Available at: https://www.bis.org/publ/bcbs255.pdf.

Basel Committeeon Banking Supervision. 2014. Basel III leverage ratio framework and disclosure requirements. Basel: Basel Committeeon Banking Supervision. Available at: https://www.bis.org/publ/bcbs270.pdf

Baxter, N.D. 1967. Leverage , risk of ruin and the cost of capital. *Journal of Finance.* 22(3):395–403.

Benlemlih, M. 2017. Corporate social responsibility and firm financing decisions: A literature review. *Journal of Multinational Financial Management*. 42–43:1–10.

Berger, A.N., Herring, R. & Szegö, G.P. 1995. The role of capital in financial institutions. *Journal of Banking and Finance*. 19:393-430.

Berger, A.N., Imbierowicz, B. & Rauch, C. 2016. The roles of corporate governance in bank failures during the recent financial crisis. *Journal of Money, Credit and Banking*. 48(4):729-770.

Bhagat, S., Bolton, B. & Lu, J. 2015. Size, leverage, and risk-taking of financial institutions. *Journal of Banking and Finance*. 59:520–537.

Bongini, P., Nieri, L. &Pelagatti, M. 2015.The importance of being systemically important financial institutions. *Journal of Banking and Finance*. 50:562-574.

Campello, M. & Giabona, E. 2013. Real assets and capital structure. *Journal of Financial & Quantitative Analysis*. 48(5): 1-37.

Carroll, A.B. 1999. Corporate social responsibility: Evolution of a definitional construct. *Business & Society*. 38(3):268–295.

Cheng, B., Ioannou, I. & Serafeim G. 2014. Corporate social responsibility and access to finance. *Strategic Management Journal*. 35(1):1-23.

Chih, H.L., Chih, H.H. & Chen, T. Y. 2010. On the determinants of corporate social responsibility: International evidence on the financial industry. *Journal of Business Ethics*. 93(1):115–135.

Cho, S.Y., Lee, C. & Pfeiffer, R.J. 2013. Corporate social responsibility performance and information asymmetry. *Journal of Accounting and Public Policy*. 32(1):71–83.

Commission of the European Communities. 2001. Green paper on promoting a European framework for corporate social responsibility. Commission of the European Communities. Available at: https://ec.europa.eu/commission/presscorner/detail/en/DOC_01_9

Cui, J., Jo, H. & Na, H. 2018. Does Corporate Social Responsibility Affect Information Asymmetry?. *Journal of Business Ethics*. 148(3):549–572.

Deegan, C. 2002. Thelegitimising effect of social and environmental disclosures - a theoretical foundation. *Accounting, Auditing and Accountability Journal*. 15(3):288-311.

De Jager, P. 2008. Panel data techniques and accounting research. *Meditary Accounting Research*. 16(2):53–68.

De Jonghe, O. & Öztekin, Ö. 2015. Bank capital management: International evidence. *Journal of Financial Intermediation*. 24(2):154–177.

Dhaliwal, D.S., Li O., Tsang A. & Yang, Y. 2011. Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *Accounting Review*. 86(1):59–100.

Dhaliwal, D.S., Radhakrishnan, S., Tsang A. & Yang, Y. 2012. Nonfinancial disclosure and analyst forecast accuracy: International evidence on corporate social responsibility disclosure. *Accounting Review*. 87(3):723–759.

El Ghoul, S., Guedhami, O., Kwok C. & Mishra, D.R. 2011. Does corporate social responsibility affect the cost of capital?. *Journal of Banking and Finance*. 35(9): 2388–2406.

Esteban-Sanchez, P., de la Cuesta-Gonzalez, M. & Paredes-Gazquez, J.D. 2017. Corporate social performance and its relation with corporate financial performance: International evidence in the banking industry. *Journal of Cleaner Production*. 162: 1102–1110.

Fama, E.F. & French, K. R. 2002. Testing trade-off and pecking order predictions about dividends and debt. *Review of Financial Studies*. 15(1):1–33.

Flannery, M.J. & Rangan, K.P. 2006. Partial adjustment toward target capital structures. *Journal of Financial Economics*. 79(3):469–506.

Frank, M.Z. & Goyal, V.K. 2003. Testing the pecking order theory of capital structure. *Journal of Financial Economics*. 63:217-248.

Frank, M.Z. & Goyal, V.K. 2009. Capital structure decisions: Which Factors Are Reliably Important?. *Financial Management*. 38(1):1-37.

Girerd-Potin, I., Jimenez-Garces, S., Louvet, P., 2011. The link between social rating and financial capital structure. *Finance*. 32: 9–52.

Girerd-Potin, I., Jimenez-Garcès, S. & Louvet, P. 2014. Which dimensions of social responsibility concern financial investors?. *Journal of Business Ethics.* 121(4):559–576.

Goss, A. & Roberts, G. S. 2011. The impact of corporate social responsibility on the cost of bank loans. *Journal of Banking and Finance.* 35(7):1794–1810.

Gropp, R. & Heider, F. 2010. Determinants of banks capital stucture. *Review of Finance*. 14(4):587-622.

Hahn, R. & Kühnen, M. 2013. Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research. *Journal of Cleaner Production*. 59:5-21.

Harjoto, M.A. & Jo, H. 2015. Legal vs. normative csr: differential impact on analyst dispersion, stock return volatility, cost of capital, and firm value. *Journal of Business Ethics*. 128(1):1–20.

Harjoto, M.A. 2017. Corporate social responsibility and degrees of operating and financial leverage. *Review of Quantitative Finance and Accounting*. 49(2):487-513.

Harris, M. & Raviv, A. 1991. The theory of capital structure. *Journal of Finance*. 46(1):297-355.

Heinkel, R., Kraus, A. & Zechner, J. 2001. The Effect of Green Investment on Corporate Behavior. *Journal of Financial and Quantitative Analysis*. 36(4):431-449.

Hong, H. & Kacperczyk, M. 2009. The price of sin: The effects of social norms on markets. *Journal of Financial Economics*. 93(1):15–36.

Hovakimian, A., Opler, T. & Titman S. 2001. The debt-equity choice. J*ournal of Financial and Quantitative Analysis*. 36(1):1-24.

Hovakimian, A., Hovakimian, G. & Tehranian, H. 2004. Determinants of target capital structure: The case of dual debt and equity issues. *Journal of Financial Economics*.

71(3):517–540.

Hurley, R., Gong, X. & Waqar, A. .2014. Understanding the loss of trust in large banks. *Marketing Intelligence and Planning*. 32(5):348–366.

Ioannou, I. & Serafeim G. 2012. What drives corporate social performance? The role of nation-level institutions. *Journal of International Business Studies*. 43(9):834-864.

Jensen, M. 1986. The agency cost of free cashflow, corporate finance and take overs. *American Economic Review*. 76(2):323-329.

Jensen, M. & Meckling, W. 1976. Theory of the firm: Managerial behaviour, agency costs and ownership. *Strategic Management Journal*. 3: 305–360.

Jizi, M.I., Salama A., Dixon R. & Stratling R. 2013. Corporate governance and corporate social responsibility disclosure: Evidence from the US banking sector. *Journal of Business Ethics*. 125(4):601–615.

Kraus, A. & Litzenberger R.H. 1973. A state-preference model of optimal financial leverage. *Journal of Finance*. 28(4), pp. 911–922.

Laeven, L. 2013. What's so special about banks?. A*nnual Review of Financial Economics*. 5:63-92.

La Rosa F., Liberatore G., Mazzi F. & Terzani S. 2018. The impact of corporate social performance on the cost of debt and access to debt financing for listed European non-financial firms. *European Management Journal*. 36:519-529.

Li, J. 2017. Accounting for banks, capital regulation and risk-taking. J*ournal of Banking and Finance*. 74:102–121.

Lopatta, K., Buchholz, F. & Kaspereit, T. 2016. Asymmetric information and corporate social responsibility. *Business and Society*. 55(3): 458–488.

Malik, M. 2015. Value-enhancing capabilities of CSR: A brief review of contemporary literature. *Journal of Business Ethics*. 127(2):419–438.

Marcus, A.J. 1983. The bank capital decision: : A time series--cross section analysis. *Journal of Finance*. 38(4):1217-1232.

Marsh, P. 1982. The choice between equity and debt : An empirical study. *Journal of Finance.* 37(1):121-144.

Modigliani, F. & Miller, M.H. 1958. The cost of capital, corporation finance and the theory of investment. *American Economic Review*. 48(3):261-297

Modigliani, F. & Miller, M.H. 1963. Corporate income taxes and the cost of capital: A correction. *American Economic Review*. 53(3):433-443

Myers, S.C. 1977. Determinants of corporate borrowing. *Journal of Financial Economics*. 5:147-175.

Myers, S.C. 1984.. The capital structure puzzle. *Journal of Finance*. 39(3): 575–592.

Myers, S.C. & Majluf, N.S. 1984. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*.13(2):187–221.

Myers, S.C. 2001. Capital structure. *Journal of Economic Perspectives*. 15(2):81–102.

Nizam, E., Ng, A., Dewandaru, G., Nagayev, R. & Nkoba, M.A. 2019. The impact of social and environmental sustainability on financial performance: A globoal analysis if the banking sector. *Journal of Multinational Financial Management.* 49:35-53.

Pérez, A. & del Bosque, I.R. 2012. The role of CSR in the corporate identity of banking service providers. *Journal of Business Ethics*. 108(2):145–166.

Pijourlet, G. 2013. Corporate social responsibility and financial decisions. European Financial Management Association Working Paper. 26:1-37. Available at: https://efmaefm.org/0efmameetings/efma%20annual%20meetings/2013-Reading/papers/EFMA_avril_2013.pdf

Rajan, R.G. & Zingales, L. 1995. What do we know about capital structure ? Some evidence from international data. *Journal of Finance*. 50(5):1421–1460.

Refinitiv. 2019. Environmental, Social and Governance (ESG) scores from Refinitiv. Available at: https://www.refinitiv.com/content/dam/marketing/en_us/documents/methodology/esg-scores-methodology.pdf

Scholtens, B. 2009. Corporate social responsibility in the international banking industry. *Journal of Business Ethics*. 86(2):159–175.

Sharfman, M.P. & Wood, C.S. 2008. Environmental risk management and the cost of capital. *Strategic Management Journal*. 29:569–592.

Shyam-Sunder, L, & Myers, S.C. 1999. Testing static tradeoff against pecking order models of capital structure. *Journal of Financial Economics*. 51(2):219-244.

Saunders, M., Lewis, P. & Thornhill, A.2009. Research methods for business students.5th ed. Italy: Lombarda.

Simon, E. 1963. Leverage and the cost of capital. *Journal of Finance*. 18(2):273-279.

Sorokina, N.Y, Thornton Jr., J.H. & Patel, A. 2017. Why do banks chose to finance with equity? *Journal of Financial Stability*. 30:36-52.

Sprinkle, G.B. & Maines, L.A. 2010. The benefits and costs of corporate social responsibility. *Business Horizons*. 53(5):445–453.

Stellner C., Klein C. & Zwergel B. 2015. Corporate social responsibility and Eurozone corporate bonds: The moderating role of country sustainability. *Journal of Banking and Finance*. 59:538–549.

Stulz, R.M. 1990. Managerial discretion and optimal financing policy. *Journal of Financial Economics.* 26(1):3-27.

Stulz, R.M. 2016. Risk management, governance, culture and risk taking in banks. *Federal Reserve Bank of New York Economic Policy Review*. 22(1):43-60.

Taggart, R.A. & Greenbaum, S.I. 1978. Bank capital and public regulation. *Journal of Money Credit and Banking*. 10(2):158-169.

Teixeira, J. , Silva, F., Fernandes A. & Alves, A. 2014. Banks' capital, regulation and the financial crisis. *North American Journal of Economics and Finance*. 28:33–58.

Titman, S. & Wessels, R. 1988. The determinants of capital structure choice. Journal of Finance. 43(1):1–19.

World Bank. 2003. Public policy for corporate social responsibility. Washington, D.C.:World Bank. Available at: https://pdfslide.net/business/publicpolicy-econference.html

Wu, M.W. & Shen, C.H. 2013. Corporate social responsibility in the banking industry: Motives and financial performance. *Journal of Banking and Finance*. 37(9):3529–3547.

Ye, K. & Zhang, R. 2011. Do lenders value corporate social responsibility? Evidence from China. *Journal of Business Ethics*. 104(2):197–206.

Yilmaz, K. 2013. Comparison of Quantitative and Qualitative Research Traditions: epistemological, theoretical, and methodological differences. *European Journal of Education*. 48(2):311-325.

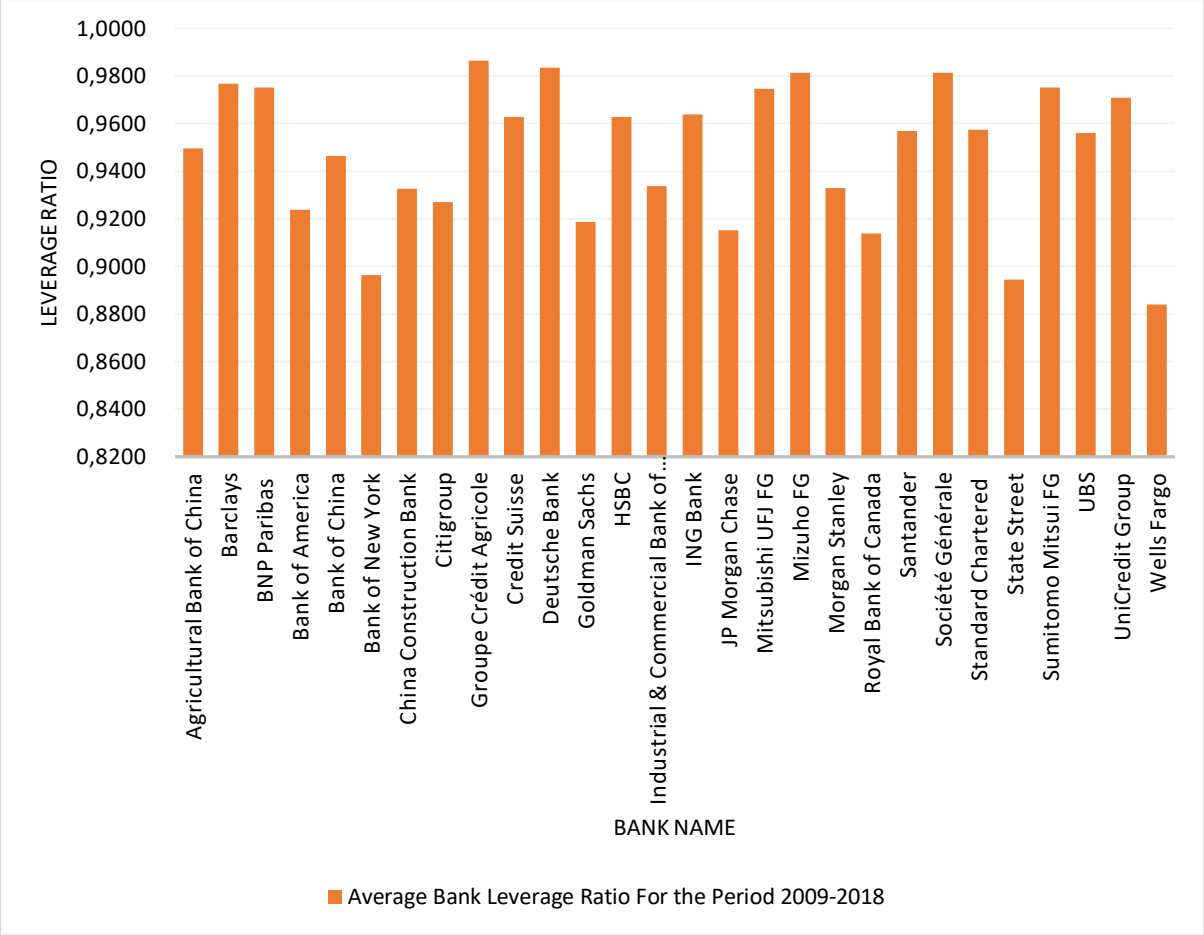
Appendices

Appendix 1: Refinitiv ESG dimensions, categories and category definitions

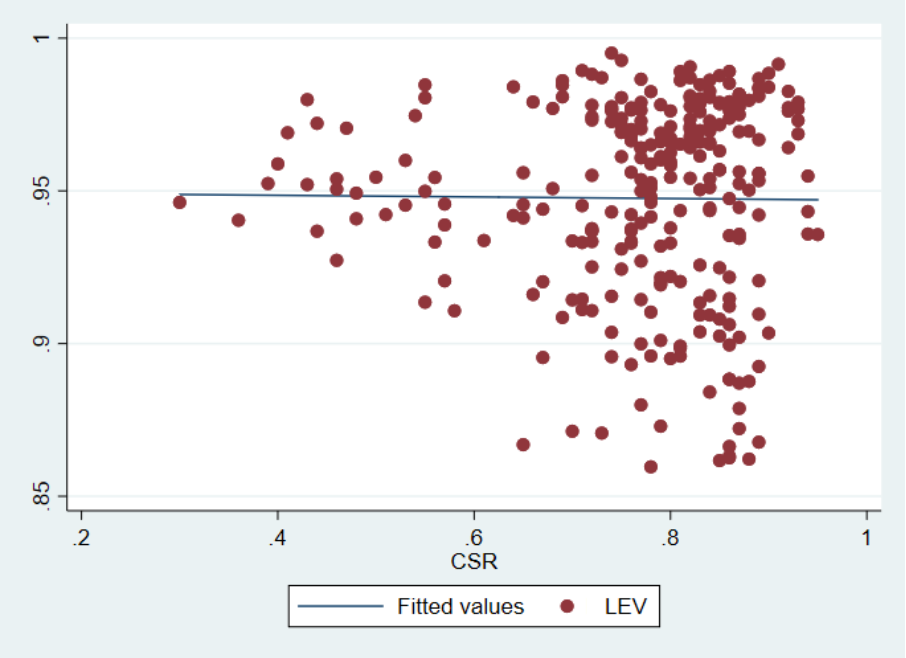
ESG Dimension	Category	Category Definitions
Environmental	Resource use	Performance and capacity to reduce the use of materials, energy or water.
	Emissions	Commitment to and effectiveness in reducing environmental emissions.
	Innovation	Reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.
Social	Workforce	Effectiveness towards job satisfaction, healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
	Community	Commitment to being a good citizen, protecting public health and respecting business ethics.
	Human Rights	Effectiveness in respecting fundamental human rights conventions.
	Product Responsibility	Capacity to produce quality goods and services, incorporating the customer's health and safety, integrity and data privacy.
Governance	Management	Commitment to and effectiveness in following best practice corporate governance principles
	Shareholders	Effectiveness in the equal treatment of shareholders and the use of anti-takeover devices.
	CSR Strategy	Reflects a company's practices to communicate that it incorporates the economic (financial), social and environmental dimensions in its day-to-day decision-making processes.

Source: Table computed using Refinitiv ESG methodology

Appendix 2: Average leverage ratios of the G-SIBS for the period 2009-2018



Appendix 3: Graphical representation of the correlation between bank leverage and CSR



Source: Computed and extracted from Stata 15 Statistical Analysis Software by the author.

Appendix 4: Results of the multicollinearity test using VIF statistics

Variable	VIF	1/VIF
size	2.17	0.460868
tang	1.80	0.555960
csr	1.73	0.579083
gdp	1.72	0.581672
arisk	1.62	0.616685
prof	1.52	0.655812
inf	1.38	0.722409
grwth	1.35	0.742076
div	1.27	0.784903
tax	1.14	0.878059
Mean VIF	1.57	

Source: Computed and extracted from Stata 15 Statistical Analysis Software by the author; Note: The equation 1/VIF defines the Tolerance which can also be used as an indicator of multicollinearity and as a rule of thumb a Tolerance of greater than 0.1 or 0.2 is indicative of no multicollinearity issues.

Appendix 5: Results from the Pooled OLS, RE & FE regression techniques (Model 1)

VARIABLES	REGRESSION TECHNIQUES		
	Pooled_OLS_	**RE**	**FE**
Constant	0.748**	1.156***	2.201***
	(0.286)	(0.202)	(0.265)
CSR	0.0101	-0.0167	-0.0299
	(0.0215)	(0.0176)	(0.0230)
SIZE	0.00142	0.00259	-0.000517
	(0.00184)	(0.00223)	(0.00903)
PROF	-0.106	0.111	0.317
	(0.336)	(0.269)	(0.256)
TANG	0.769***	0.235	-0.926***
	(0.258)	(0.205)	(0.286)
GRWTH	-0.570***	-0.464***	-0.318***
	(0.165)	(0.113)	(0.109)
ARISK	-0.591**	-0.170*	-0.184**
	(0.275)	(0.0894)	(0.0832)
DIV	-0.0198**	-0.0176*	-0.00769***
	(0.00734)	(0.00920)	(0.00216)
TAX	-0.208**	-0.0572	0.0265
	(0.0758)	(0.0348)	(0.0486)
GDP	0.00222**	0.00151***	0.00105**
	(0.000977)	(0.000481)	(0.000419)
INF	0.270	0.454***	0.382***
	(0.164)	(0.108)	(0.109)
R-squared	0.613	0.208	0.329
OV Test	13.48 [0.0000]	-	-
Wald Test	-	133.42 [0.0000]	-
F-Test	-	-	24.17 [0.0000]
Number of observations	220	220	220
Number of Banks	28	28	28

*Clustered standard errors in parentheses ():***,** and * denotes significance at 1%, 5% and 10%, respectively*

Appendix 6: Results of the Hausman Specification Test

	Coefficients			
	(b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
csr	-.0265796	-.0279399	.0013602	.0035695
size	-.007089	-.0008382	-.0062508	.0035982
prof	.0300685	-.0382653	.0683338	.0213742
tang	.5431568	.7422955	-.1991387	.0799129
grwth	-.9009692	-.9065206	.0055513	.
arisk	.0331755	-.0184613	.0516368	.
div	.000407	-.0061033	.0065104	.0006363
gdp	-.0425757	-.078023	.0354473	.
tax	.000833	.0007102	.0001229	.
inf	.1262903	.0922998	.0339906	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(10) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 96.44
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Source: Computed and extracted from Stata 15 Statistical Analysis Software by the author

Appendix 7: Stata 15 Statistical Analysis Software regression codes

Command	Regression Code
Pooled OLS Regression	reg lev l.csr l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf, vce(cluster panelvar)
Ramsey RESET Test	reg lev l.csr l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf, vce(cluster panelvar)
	ovtest
Multicollinearity Test Using VIF Statistics	reg lev l.csr l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf, vce(cluster panelvar)
	vif
Hausman Test	xtreg lev csr size prof tang grwth arisk div gdp tax inf, re
	estimate store re
	xtreg lev csr size prof tang grwth arisk div gdp tax inf, fe
	estimate store fe
	hausman fe re
Fixed Effects Regression (Model 1)	xtreg lev l.csr l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf, re vce(cluster panelvar)
Fixed Effects Regression (Model 1a)	xtreg lev l.env l.soc l.gov l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf, re vce(cluster panelvar)
Fixed Effects Regression (Model 2)	xtreg lev l.csr l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf csrsize, fe vce(cluster panelvar)
Fixed Effects Regression (Model 2a)	xtreg lev l.env l.soc l.gov l.size l.prof l.tang l.grwth l.arisk div gdp l.tax inf envsize socsize govsize, fe vce(cluster panelvar)